

T H E S I S

For the Degree of M.D., EDINBURGH UNIVERSITY

PYREXIA UNCERTAIN in ORIGIN during the
GREAT WAR (1914-1918)
With NOTES on DIAGNOSIS

by

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F O R E W O R D .

The term Pyrexia uncertain in origin is 'coined' from the Army Nomenclature of Disease Book, where it appears under General Diseases Group D. Nomenclature number 34 (Pyrexia of uncertain origin).

How frequently this number was utilized during the War for Invaliding Disabilities, Case Sheets, Board Papers, etc., would be difficult to conjecture.

The term signifies that the patient is suffering from an elevation of temperature which might be due to one or more of a multiplicity of causes, the actual cause, at the time, being unknown or uncertain. In advanced areas of the respective Fronts the convenience of such a term was obvious, and in the stress of warfare, a busy Regimental Medical Officer was frequently forced to attach this Diagnosis to the soldier pending further investigation by the Medical Authorities, who had greater facilities, up-to-date/

date laboratories, and so on, at their disposal.

P.U.O., in fact, was of empirical significance, one might say, "covering a multitude of diseases".

The Temperature Charts shown are original copies from original Charts made on service. Unfortunately, a Note Book containing over 100 Charts of actual Cases, originally diagnosed "Pyrexia uncertain in origin", was sent off by post to Scotland in 1918 and it failed to reach its destination and was never traced. After this loss, I had access to some of the Charts which appear in this paper, and which had been made from Cases seen towards the latter end of 1917, the copies being made later in 1918. Of the Charts shown, all were originally Cases diagnosed 'P.U.O.' or P-N.Y.D.'

P Y R E X I A

The term Pyrexia is even wider than Fever, and includes Fever, until such time as the diagnosis ceases to be of uncertain origin and the patient is elevated to the dignity of receiving a new nomenclature number and a new diagnosis. But, even to this day it is to be supposed that thousands of cases of P.U.O. remained P.U.O. as the cause of Pyrexia is still undiscovered. Large numbers of the patients had Pyrexia for short periods of time which did not incapacitate to any serious degree, the cause may or may not have been discovered or conjectured. In other cases, the patients had prolonged periods of Pyrexia, which involved evacuation to the base or invaliding to England.

At the Base, further attempts were made to discover the possible cause, with the aid of frequent bacteriological examinations of the blood, faeces, sputum etc. The medical officer and the bacteriologist alike were often baffled. The Consultant Surgeon or Physician might be called in to look at "an interesting/

interesting case". Further investigations are recommended and perhaps the Radiographer comes to the aid. In spite of every concentration of specialised knowledge, the cause may still be uncertain. Perhaps the Neurologist might help us. He, too, sees the case and is bewildered.

If the Pyrexia persisted, the destructive phase of the metabolism of the body increases and the patient shows marked wasting.

An Invaliding Board is held and numerous additions as to the investigations conducted at the Base are added to the soldier's medical history, but he is still perhaps, P.U.O. and receiving empirical treatment.

No doubt, large numbers of cases of Pyrexia were soon solved at the Casualty Clearing Stations, Stationary Hospitals and elsewhere. In the Mediterranean area especially a blood film often cleared up the diagnosis and entitled the patient to a new diagnosis such as Malaria, Relapsing Fever and so on.

Some cases died and Post mortem examination soon revealed the true cause of the Pyrexia and likewise the cause of death.

F E V E R .

When one thinks of fever more is implied than Pyrexia. We have here a toxic disturbance of metabolism, in response to the invasion of micro-organisms, which may or may not be pathologically identified and involving a disturbance of the regulation of temperature.

In some cases the temperature may be elevated yet no true fever is discernible, in others, fever may be present and there is no obvious elevation of temperature.

Speaking generally, the fever process is accompanied by increased metabolism, increased breaking down and tissue waste.

The waste products are retained and often accumulate due to defective action of the skin, renal organs and intestines.

The tongue becomes dry and furred, the saliva diminished. The digestion is out of order and there is Anorexia. Thirst and constipation are often present.

The/

The urine is scanty, often highly coloured with a high specific gravity. Chlorides are deficient and the urea excretion may be much increased. Albuminuria may be present, transient or otherwise.

The pulse and respirations are accelerated but not necessarily in proportion to the elevation of temperature. The respirations usually vary with the rapidity of the heart unless the lungs or heart are especially associated with the process. A Leucocytosis may be present, perhaps a Leucopenia.

Rashes may be present and the skin is usually hot and frequently dry. Sweating may be a characteristic, as in Rheumatic Fever. The skin may be tender and sore.

Delirium, Headaches, Insomnia with Malaise indicate the effect of the fever process on the Nervous System.

The Pyrexia is often protective and is only in part the cause of the aforementioned symptoms which are evidence of Toxaemia, produced by the invading germs.

When the temperature exceeds 106° F. the term Hyperpyrexia is applied.

GENERAL CAUSES of PYREXIA.

1. Organismal infection, including animal parasites. The organism may be identified or still unknown.
2. Toxic infection, exotoxic products of organisms, which organisms actually themselves do not produce the Pyrexia.
3. Central disturbance of the heat regulating mechanism. This may be due to a number of causes such as Nervous Lesions involving the Pons Varolii, reflex stimulation.

The heat centres are said to be in the Medulla. By an intricate system of reflex arcs the Thermogenetic centres regulate the blood supply of the skin, thereby affecting the excretion and secretion of sweat, sweating causing a loss of heat, the evaporation being associated with a cooling effect.

Vaso Constrictor and Vaso Dilator centres regulate the supply of blood to the skin.

It is stated that in fever more heat is produced than is discharged and the balance between production/

production and discharge is disturbed. The production of heat may be much greater than the loss of heat, or the loss may not keep pace with the increase of heat production.

4. Post haemorrhagic Pyrexia occurs after haemorrhage has ceased, especially concealed haemorrhage, the temperature rising to 101°-102° F. for a few days, even though the effusion is free from organismal infection.
5. Exposure to great heat, supposed to be due to a disturbance of the Thermogenetic Mechanism caused by the excessive external heat. The temperature of the body rises and there may be Hyperpyrexia. The heat may be from the sun, but not necessarily and the degree of relative humidity of the atmosphere is an important factor.
6. The action of drugs.
7. Exudations into the tissues may be sufficient to cause Pyrexia in the absence of micro-organismal invasion. Following a simple fracture the temperature often rises to 100° - 102° F. on the second and third days. This is usually in proportion to the amount of bruising of the parts and may in part be due to fibrin ferment.

In the discussion of Pyrexia in this paper only such conditions as were of comparatively frequent occurrence among the soldiers, will be considered, and on account of their relative rarity among the forces, haemophilia, other blood diseases and rarer conditions will be omitted, but ought always to be borne in mind, as possible causes of Pyrexia. On the respective Fronts, as a rule, Medical Cases were clearly differentiated from Surgical Cases, wherever possible. This differentiation occurred at the Casualty Clearing Stations and Stationary Hospitals, and less so in Field Ambulances, more so in Base Hospitals. A soldier with, for example, Relapsing Fever and multiple boils, would be on the Surgical or Medical side, depending on which was the graver condition, or which required the more active treatment.

Local inflammations were very commonly the cause of Pyrexia, but were much more frequently dealt with and seen on the Surgical side, where, other and obvious causes of Pyrexia being excluded, difficulties of diagnosis did not arise.

The number of cases of I.C.T., or inflammation of the connective tissue, which were seen on all Fronts, was considerable, often being accompanied by septic absorption, Pyrexia was frequent, but the origin was usually apparent

VARIETIES of PYREXIA.

I. CONTINUED.

The temperature is maintained for a certain number of days, the daily variation being slight. The height of the temperature varies as to the level, but is well above 98.4° F.

Example:- Pneumonia and Smallpox.

II. INTERMITTENT.

During the course of the fever, the temperature falls to normal, this often occurring during the day.

Example:- Malaria.

III. REMITTENT.

In the morning hours the fall exceeds a degree and a half, the temperature remaining above normal.

Example:- Tuberculosis.

IV. RELAPSING FEVER.

The periods of Pyrexia are succeeded by apyrexial periods.

V. HECTIC FEVER.

The evening temperature is elevated and the temperature falls in the morning, perhaps to normal.

VI. IRREGULAR.

Where/

Where the Pyrexia is irregular and cannot be classed in one of the former varieties.

Example:- Certain clinical varieties of Trench Fever. (q.v.)

ONSET of FEVER.

The onset may be sudden associated with a rigor, the temperature rising to several degrees above normal in a few hours; or gradual, the patient feeling 'out of sorts' for several days, with malaise, etc., the pyrexia being manifested by a slight evening rise of temperature.

DECLINE of FEVER.

The temperature may fall rapidly to normal or subnormal, termed, fall by Crisis, or gradually return to normal after several days have elapsed, fall by Lysis.

DISEASES ASSOCIATED with PYREXIA.

The number of diseases associated with pyrexia is multifold and a more difficult matter to decide would be what diseases are not associated with Pyrexia.

In the Expeditionary Force, in the Mediterranean/

Mediterranean areas, as compared to those in Europe, the additional factor of Tropical Diseases, with the prevalence of concomitant fevers arises. One might accordingly discuss Pyrexia under two headings

I. Mediterranean Areas and more especially
Egypt and Palestine.

II. European Areas including France, Flanders
and Belgium.

I. PYREXIA in EGYPT and PALESTINE in Special
RELATION to TROPICAL DISEASES.

In considering a Clinical Case of Pyrexia in Egypt, the first thought that arises, concerns the possibility of a disease associated with a tropical climate such as Malaria, and Sand Fly Fever. Here, once more, one might discuss a multiplicity of tropical diseases, but only the commoner will be mentioned in detail. At the same time, it happened too frequently, that a routine blood examination was expected to clear up the diagnosis, and failed conspicuously.

The field of diagnosis in a tropical country is greater than that, say, in the United Kingdom or Europe, because the case of Pyrexia might prove to be due to Tropical disease, or a disease such/

such as is prevalent at home and accompanied by Pyrexia, there being no reason why it is unlikely to occur abroad, and this conspicuously refers to the Coli-Typhoid Group of Diseases.

In passing, one might add that cases of P.U.O. were generally considered as "Medical Side" but often after systematic examination proved to necessitate surgical interference. The Surgical aspect, however, will not be considered.

A. MALARIA including BLACKWATER FEVER.

Malaria is a disease which is probably one of the commonest and most important of human diseases in the Mediterranean Areas.

In the pyrexial stage many difficulties are met with in diagnosis from the Temperature Chart. The characteristic temperature waves were marked by mixed infections, and one attack ensued before another had abated. These latter are called subintra infections, and are due to atypical developmental periodicity of the invading parasite, or to reinfection by the same parasite at a period or periods subsequent to the original infection.

A blood film is of the utmost importance, and both a film and stained film, ought to be examined./

examined. If negative, one ought to enquire about a clinical history of Malaria; From the blood. Valuable information is obtained as to a diminished red cell count, reduction of haemoglobin, increase of large mononuclears, and a leucopenia. From an examination of the abdomen and a palpable spleen, the diagnosis may be tentative.

Quinine may be used as a therapeutic test, and it might prevent further attacks of fever.

Malaria may be superimposed upon Typhoid, & Paratyphoid, which still further complicates the Temperature Chart.

Dengue, hepatitis, Malta Fever, Relapsing Fever, Yellow Fever and Liver Abscess may be mistaken for Malaria. One must also consider non-tropical infections such as Influenza, Tuberculosis, Cerebro-Spinal Fever and Pneumonia.

Pneumonia might complicate Malaria or vice versa, and pneumonic varieties of malaria are by no means unknown (Vide infra). Again, malaria may be associated with jaundice, bilious malaria, and dysentery may actually be caused by the malarial parasite, (q.v.) while nephritis may be a complication.

Abdominal pain, malarial in origin, is not uncommon. The site of pain may be the appendicular region, over the Gall Bladder, pancreas and stomach and/

and laparotomy has been performed more than once. The operation frequently aggravated the condition, and may have proved fatal, a course of quinine might have obviated the necessity of a wooden cross.

A considerable number of cases of Sub-tertian malaria, which were particularly fatal, occurred in Palestine, where both Benign tertian and malignant malaria were endemic.

Three well marked varieties occurred:-

- (1). THE CEREBRAL or COMATOSE TYPE, accompanied by hyperpyrexia and delirium. This type is stated to be due to a blocking of the terminal blood vessels in the brain by cells laden with the parasite. A blood film during the first two days may be negative and on the third day minute ring forms only may be found. In diagnosis heat stroke ought to be excluded.
- (2). DYSENTERIC TYPE. As blood and mucous occur in the stools and the patient suffers from vomiting and diarrhoea, too often the Medical Officer was satisfied with the diagnosis of Dysentery. This variety is stated to be due to the blocking of the capillaries of the intestine by the parasite. As a rule a blood film would clear up the diagnosis, as ring and crescent forms are present in the blood stream.

If/

If the case is treated as dysentery pure and simple, a fatal termination is of common occurrence.

- (3) PNEUMONIC TYPE. The symptoms simulate pneumonia with blood stained sputum. The malarial parasite is present in the circulation and the value of a blood film is again apparent.

It is to be noted that if a malarial patient develops an infective condition such as pneumonia, and the malarial condition has been latent for some time, the malarial parasites are found in the blood without the patient necessarily showing evidence of malarial attacks, typical or atypical.

Malaria is now notifiable (as from 1st March 1919) Public Health Regulations, 1919, of the Local Government Board (now the Ministry of Health). Article V.

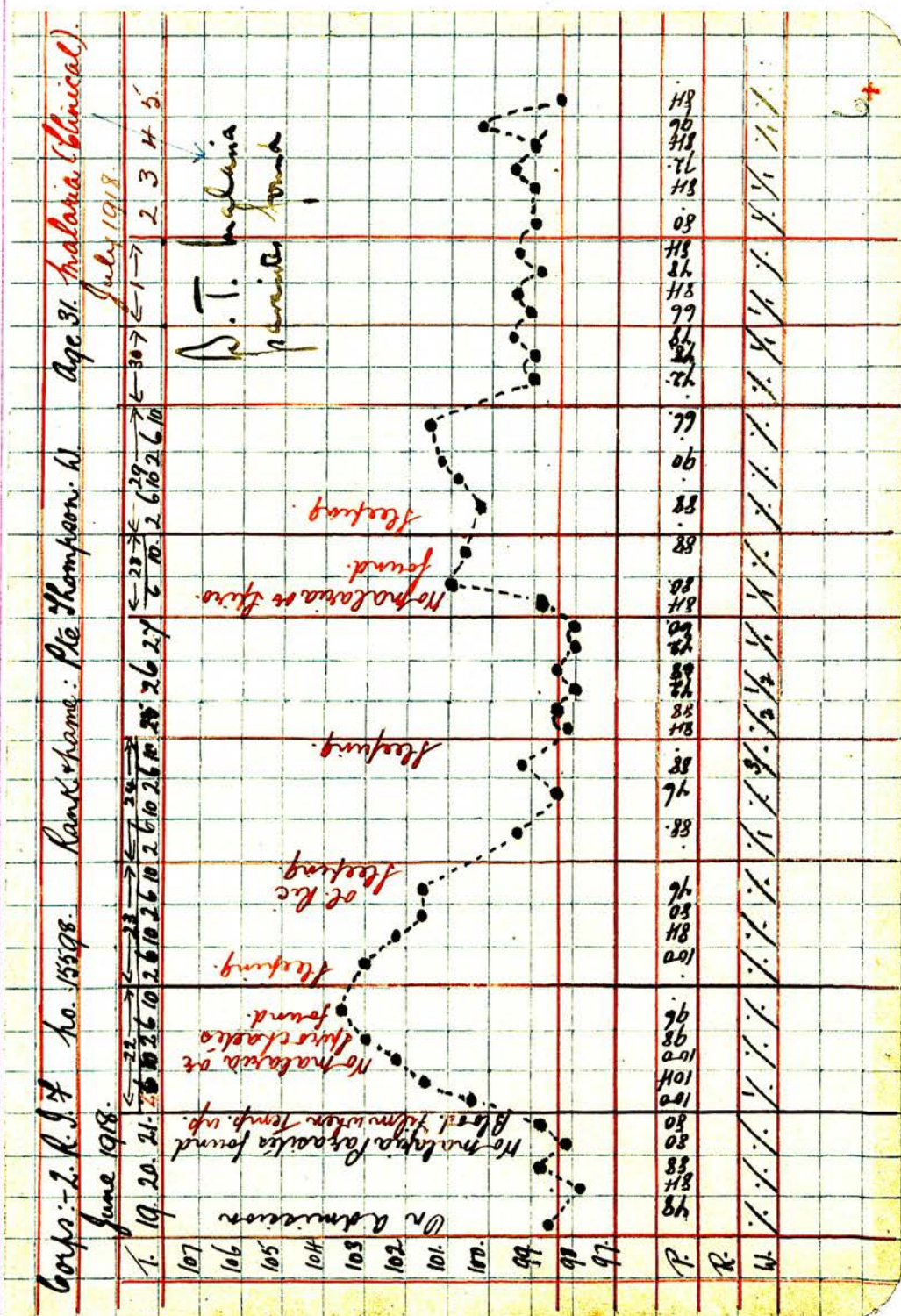
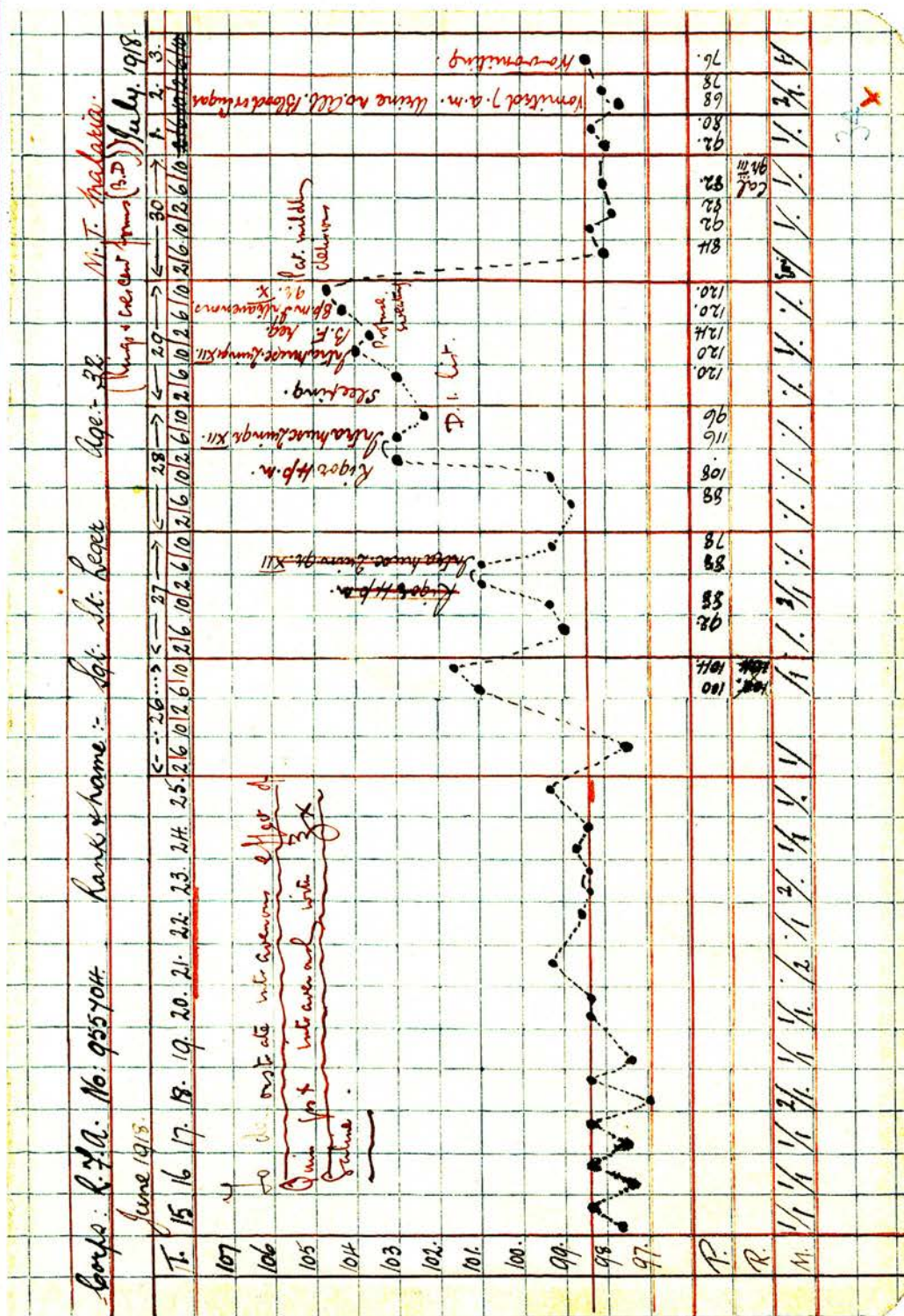


CHART 34.



BLACKWATER FEVER.

In persons who have suffered repeatedly from malarial attacks, and who are susceptible, Blackwater fever may occur. Cases have occurred in England among the malarious troops who had served in the Eastern Fronts and the Balkans.

The characteristic feature of the disease is Haemoglobinuria. The onset is generally sudden, the temperature rising rapidly to 103° - 105° F., and it simulates a severe malarial rigor, with its usual concomitants, intense ^{anaemia} ~~malaise~~ rapidly appears, followed by an icteric tint of eyes and skin.

After Blackwater fever has manifested itself, the parasites of malaria are not to be found in the blood, which is thin and watery. The erythrocytes may fall to two million per cubic millimetre.

In all malaria attacks, a routine examination of the urine during and after the rigor must be insisted on.

In differential diagnosis from severe bilious remittent malarial fever, acute yellow atrophy, yellow fever and Weil's disease, the presence of haemoglobinuria excludes the aforementioned.

B. SAND FLY FEVER.

This fever of short duration is also known as Pappataci and Phlebotomus Fever. It is usually present in the summer time and the infection is carried by the Phlebotomus Pappatasii, which is a dipterous fly.

The causal agent is, probably, an ultra microscopic virus. It is believed to be distinctive from Dengue, and is rarely fatal.

After infection the temperature rises rapidly, reaching 102°-103° F. usually within 24 hours. It begins to fall on the second or third days and the temperature becomes normal by the fourth day, and remains normal.

If a blood count is made a leucopenia with reduction of the polymorphonuclear cells is found. Bradycardia may be present.

At the outset of the disease the Coli-typhoid group are to be considered. Malaria, Dengue, Influenza and Mediterranean Fever must be excluded. Quinine is valueless in Sand Fly Fever.

A normal temperature after three to four days, the temperature coming down gradually, provides a different clinical picture from an ague attack. There is no catarrh of the respiratory passages, as in influenza, and in dengue a rash is common which resembles/

resembles measles or scarlatina. A rash may be found in Sand Fly Fever, which is due to scratching and sand fly bites, and may simulate the skin appearance seen in Chicken-pox.

At the onset of the disease, the diagnosis was usually P.U.O. and after a few days, the temporary indisposition was accredited to Phlebotomus Fever. Convalescence was usually speedy, but may be prolonged, and associated with anorexia, depression and even insomnia.

C. COLI-TYPHOID GROUP and AMOEBIC DYSENTERY.

(1) DYSENTERY.

This disease the 'bloody flux' was very prevalent in the Armies serving in the Eastern Mediterranean Area, and contributed to the 'bills of mortality'. During war-time, the disease has caused severe ravages among soldiers, and for centuries has been the scourge of Armies.

Fortunately now we are in a better position to treat the disease than in bygone centuries.

In Egypt, in the big towns of Lower Egypt, Cairo and Alexandria, some years ago, the mortality from dysentery was:-

in/

in CAIRO about 80%

LOWER EGYPT 72%

ALEXANDRIA 42%

of total number of deaths. Many cases became chronic with partial or complete incapacity.

The research of LÖSCH and his observation of amoebae in the stools of patients suffering from the disease, added greatly to our knowledge of the disease. The amoeba-coli caused difficulties, as it is found in the intestine under normal conditions. The amoeba of dysentery is now known as Entamoeba histolytica; and the amoeba coli, Entamoeba coli, which is now pathogenic.

In Egypt and Palestine the 'khamisin' which is associated with dust storms, prepares the intestinal mucosa for invasion by intestinal organisms, irritative dust particles being swallowed.

Amoebic Dysentery is more common in warm weather, bacillary in winter, dual infection being of frequent occurrence.

Epidemic dysentery may be caused by flagellates, such as Trichomonas hominis, or coccidia (Gallipoli). A case has been quoted of chronic Lamblia infection suddenly developing acute symptoms of a choleraic type, immediate intravenous infusion with hypertonic solution was required, owing to the dangerous cardiac collapse.

(1).A. BACILLARY DYSENTERY.

This is produced by Shiga or Flexner bacillus, but may be caused by other members of the dysentery group. The Shiga infections were more common in Mediterranean cases than Flexner, they were also more serious and of higher toxicity.

The temperature usually rises and is generally much higher than in Amoebic Dysentery, Bacillary Dysentery tending to be more acute and toxaemic than amoebic dysentery.

The classical symptoms are well known and the degrees of infection vary from mild to choleraic, with a serous stool and rapid wasting. In those latter cases, early intravenous saline (hypertonic) infusion may be of great use.

Clinically the disease cannot, as a rule, be distinguished from amoebic dysentery, the microscope and bacteriologist coming to our aid.

The rise of temperature in Amoebic Dysentery is slight, if at all, and the onset is more insidious.

It is said that the stools, in cases of Bacillary Dysentery are white, due to the large number of pus cells, whilst in Amoebic Dysentery, the colour is brown and greenish. This is insufficient to decide as to which variety one is dealing with.

DIFFERENTIAL/

DIFFERENTIAL DIAGNOSIS.

1. Amoebic Dysentery (Vide ante).
2. Dysentery due to Bilharzia (See under 'O').
3. Diarrhoea produced by organisms other than those of Coli-typhoid group G.B. Pyocyaneus.
4. Irritant diarrhoea.

Dysentery frequently complicates Typhoid or Paratyphoid. It is worthy of note that among cases of typhoid in which there was pain or tenderness over the bladder; a desire to pass water very often or a feeling of 'full' bladder, when it was not, generally turns out to be a dysenteric complication.

Among Indian patients malaria and scurvy were comparatively frequent complicating factors.

In addition, intestinal gangrene, peritonitis, arthritis, polyneuritis and other complications may be met with.

(1) B. AMOEBIC DYSENTERY.

(Included for completion of Dysentery).

Here the fly plays one of the most important parts in the dissemination of the virus, ~~but~~ amoeba histolytica, in its cystic form, transmits it to food and drink.

Rise of temperature is not marked, in the absence of complications, and may be absent.

Toxaemia and Pyrexia are less marked than in the bacillary form.

In regard to incubation period, it is of interest to quote that a patient landed in Alexandria from England at 4.30.p.m. on Friday. He had never been out of England before: had landed at Malta on the way out for three quarters of an hour: he did not eat or drink there: marched to a Rest Camp where cases of dysentery were occurring. Forty hours after landing (9.a.m. Sunday), he had abdominal pain, 10 a.m., diarrhoea, 11 p.m., blood and mucous, - 54 hours after landing. Amoebae present in stool (B.D.).

DIFFERENTIAL/

DIFFERENTIAL DIAGNOSIS.

Vide Bacillary Dysentery.

COMPLICATIONS.

Hepatitis,

Liver Abscess,

Intestinal gangrene, &

Peritonitis.

Appendicitis (immediate and remote complication).

Jaundice.

The treatment by Emetine and the importance of dietetics need not be discussed here.

(Vide Report of War Office Dysentery Committee).

SURGICAL/

SURGICAL TREATMENT.

In regard to appendicostomy in acute cases, it is probably inadvisable, in chronic cases it is unlikely to be of value, because in Amoebic Dysentery the bowel does not heal as well as in the normal bowel, and there is a danger of peritonitis following, due to lack of adhesions forming.

In chronic colitis, appendicostomy is often successful, as it enables the bowel to be flushed out in a thorough manner.

In severe cases which have resisted other forms of treatment, the patient is unlikely to stand the operation, the resistance of the tissues being lowered to septic infection.

In cases of Bacillary Dysentery favourable results may be got, if all other conditions are favourable.

(Col.A. H. Tubby).

LIVER ABSCESS.

The repetition of the treatment of amoebic dysentery with emetine at **intervals** during the period of convalescence should obviate this important sequela of amoebic infection.

Hepatic abscess is stated to have developed in cases which have apparently never suffered from dysentery, and it is often the slighter cases of Amoebic Dysentery or of unrecognised infection, that give rise to this abscess.

In this condition the temperature is hectic in type. A differential blood count is of the utmost importance and in the early condition, without suppuration, you find a leucocytosis with slight increase of polymorphs. The fever is then low remittent in type. After formation of the abscess, the leucocytosis/

leucocytosis is still present and the polymorphs are very slightly increased, this latter observation being of importance.

It may follow quickly on an attack or after a long period of good health. If accompanied by Jaundice, this is a grave symptom, indicating multiple septic abscesses.

DIFFERENTIAL DIAGNOSIS.

We have here a wide field of diseases to consider, among the more important being malaria, malarial hepatitis, gall bladder inflammation, hydatid cysts, scurvy and Malta Fever.

Pain is sometimes referred to the appendicular region and may suggest appendicitis.

Crepitations or pleuritic friction in the right base of the lung may suggest Tuberculosis, and the Chest ought certainly to be examined in such cases. Night sweating, pyrexia, general malaise, loss of appetite and digestive disturbances, dry cough, irritability, all may point to a diagnosis of chest trouble. Radiography is of importance.

CHRONIC DYSENTERY.

In cases of Chronic diarrhoea, syphilis, tuberculosis and early cancer of the rectum must be considered and excluded. Even severe haemorrhoids have been mistaken for, - and treated as chronic dysentery.

Dysentery/

Dysentery is now notifiable, dysentery including amoebic and bacillary dysentery. (1st March. 1919).

(2) TYPHOID FEVER.

We are here dealing with a fever the causal bacillus of which is not easily recognised, in view of its resemblance to a number of organisms, both in morphology and cultural characters.

During the South African War, it is stated that nearly half the deaths from all causes were due to enteric fever.

Preventive inoculation in the Great War, enormously reduced admission rates and was a powerful aid in resisting the attacks of Bacillus typhosus. The Army system for the examination of enteric fever convalescents and ^{carriers} ~~cases~~, did much to prevent the spread of infection. Special hospitals were set apart for the observation and treatment of all cases of Typhoid and Paratyphoid Fevers, occurring either in this country or invalided from overseas to the United Kingdom. (Enteric Depots, Typhoid Convalescent Hospitals &c.)

The general features of the disease are so well known as not to necessitate a description or detail.

"The proof of the pudding is the eating thereof",/

thereof", the proof of enteric fever is the isolation of the bacillus typhosus from the blood of the patient necessitating a skilled bacteriologist. This was not always possible in practice, in view of triple inoculation, we had to rely more on the 'agglutination curve'. (Vide under Trench Fever, differential diagnosis, Enteric Fever).

The gradual zig-zag rise in the temperature is important, the level in the morning being higher than that of the morning before, though lower than that of the night before.

The examination of the blood and a count, evidence a low leucocyte count, reduction of eosinophiles and polymorphs, and a relative increase of lymphocytes.

DIFFERENTIAL DIAGNOSIS.

Of diseases common to the Mediterranean Areas, Typhoid Fever must be distinguished from Malaria: by an examination of Charts, it is obvious how paratyphoid may closely resemble malaria and vice versa. Malaria may run concurrently with Typhoid.

Dysentery, Relapsing Fever, Dengue (resembling early Typhoid), Phlebotomus Fever, (resembling an abortive typhoid), Malta Fever, and Typhus, all require to be considered. In France and elsewhere on the Continent, Cerebro-Spinal Fever and Trench Fever demand/

demand thought. Various other conditions necessitate attention, especially such as involve the respiratory system, above all acute lobar pneumonia. The lungs ought always to be examined and the respiration rate observed. In lobar pneumonia, the onset is more abrupt and well marked, the respiration rate helps to differentiate.

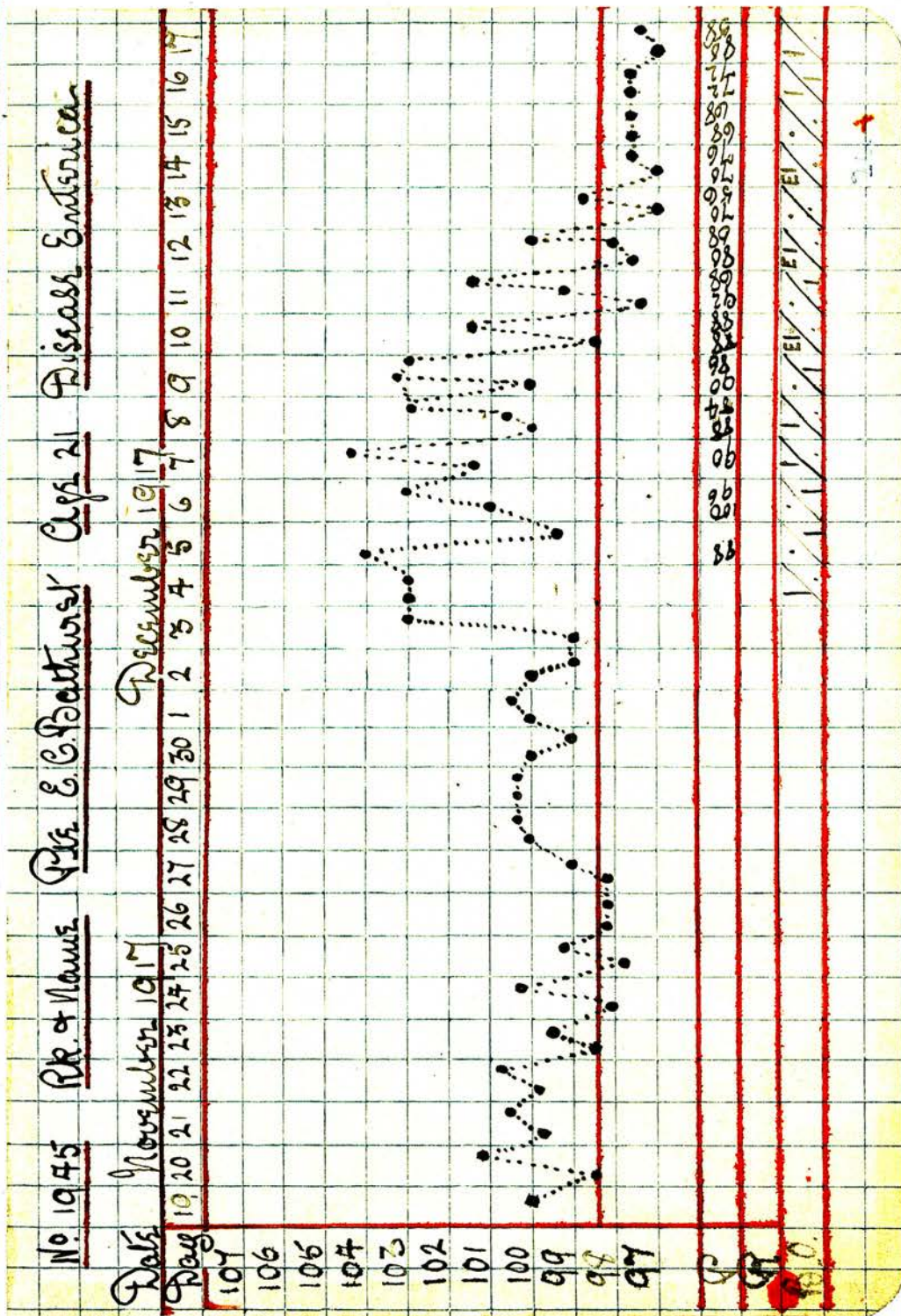
Herpes is rare in typhoid. A blood count if low, is against diagnosis of pneumonia. The co-existence of the diseases must not be forgotten.

Tubercular conditions ^{as} ~~of~~ acute miliary tuberculosis, meningitis, peritonitis, often give rise to considerations in diagnosis.

Indeed there are a host of other diseases which may be mistaken for enteric fever, and among them may be mentioned appendicitis, cholecystitis, influenza, pyaemia and acute rheumatism.

CHART/

CHART 26.



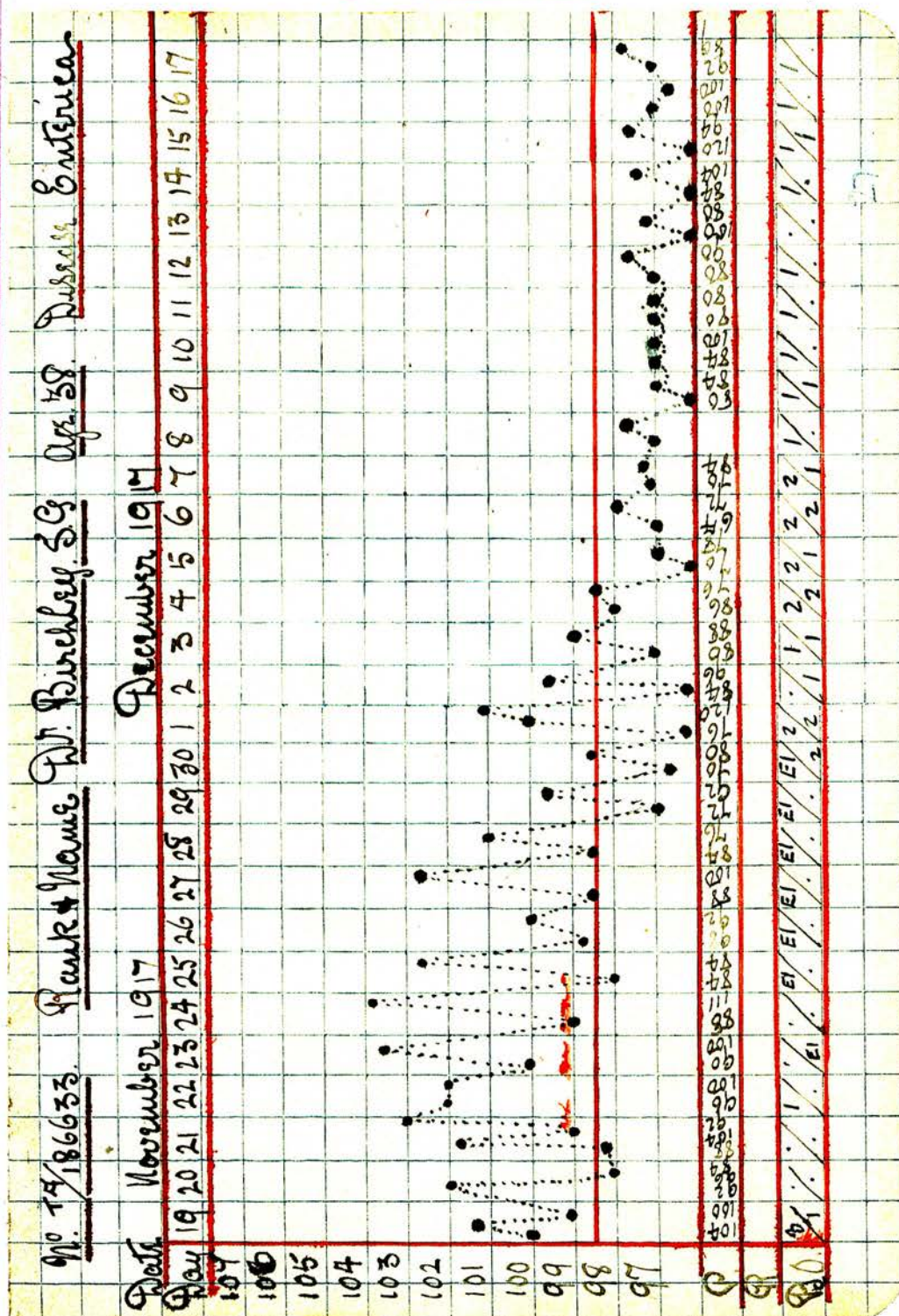
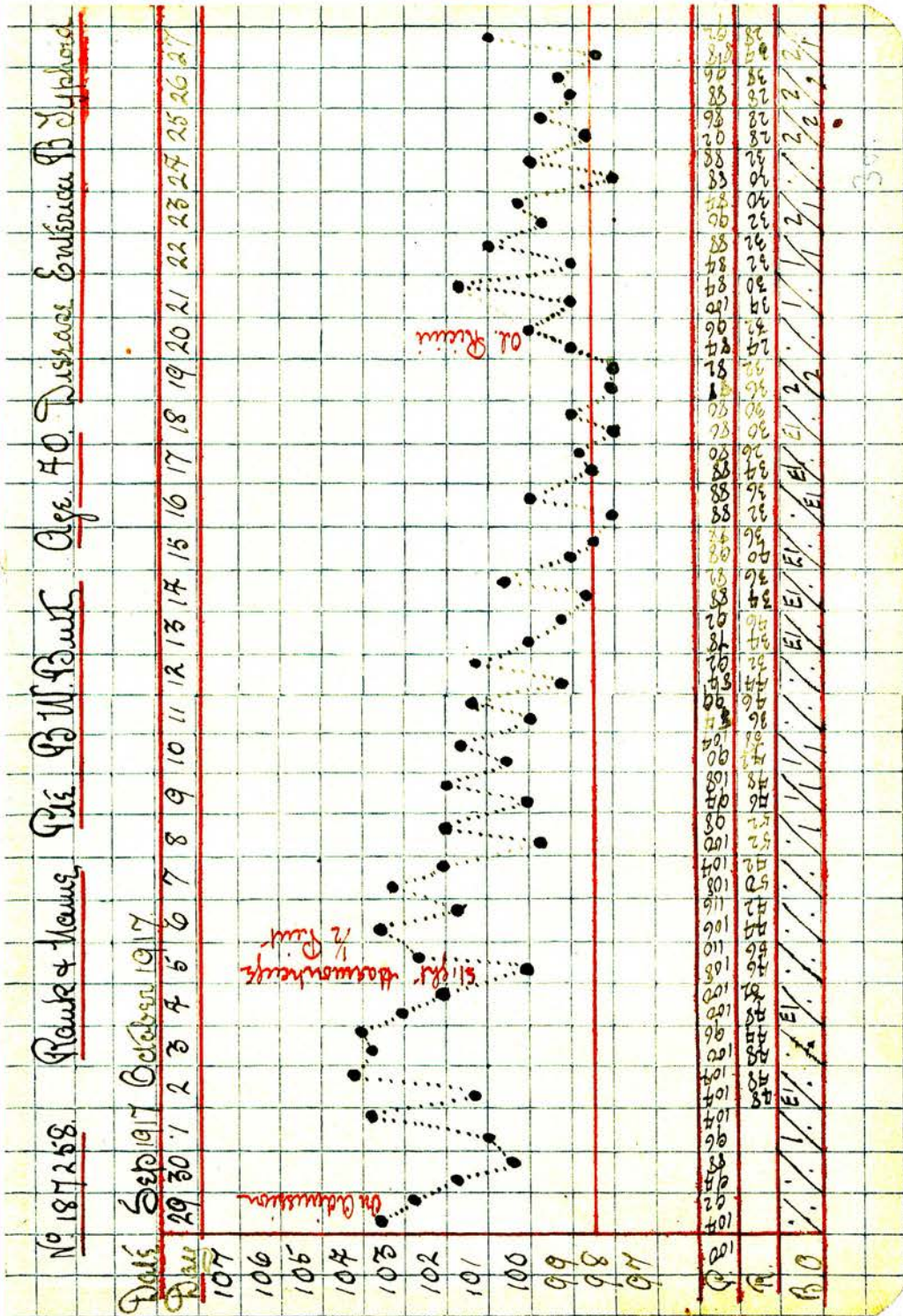


CHART 30.



(3) PARATYPHOID FEVER.

Anti paratyphoid inoculation was carried out for this disease and was identified with success. It is doubtful if anti-typhoid vaccination afforded any protection.

Paratyphoid fever undoubtedly was responsible for the invaliding of many soldiers serving with the Mediterranean forces.

The two distinct and separate bacilli *B. paratyphosus* A. & *Bac. paratyphosus* B., are responsible for the two respective varieties of paratyphoid fever. The former is the commoner variety, met with in Egypt, and it runs a slightly longer course, and is usually milder than the latter.

Clinically paratyphoid fever is indistinguishable from enteric, the organisms differing from *B. typhosus* in their behaviour with specific immune sera and in certain cultural reactions.

The spikey temperature is characteristic, up at night, down in the morning. Bradycardia is significant, and most important.

DIFFERENTIAL DIAGNOSIS.

Vide under TYPHOID, in addition may be mentioned Icterus, Influenza, especially of the gastric variety, bronchitis and *B. coli* septicaemia. *B. coli communis* sometimes causes an infective gastro-enteritis/

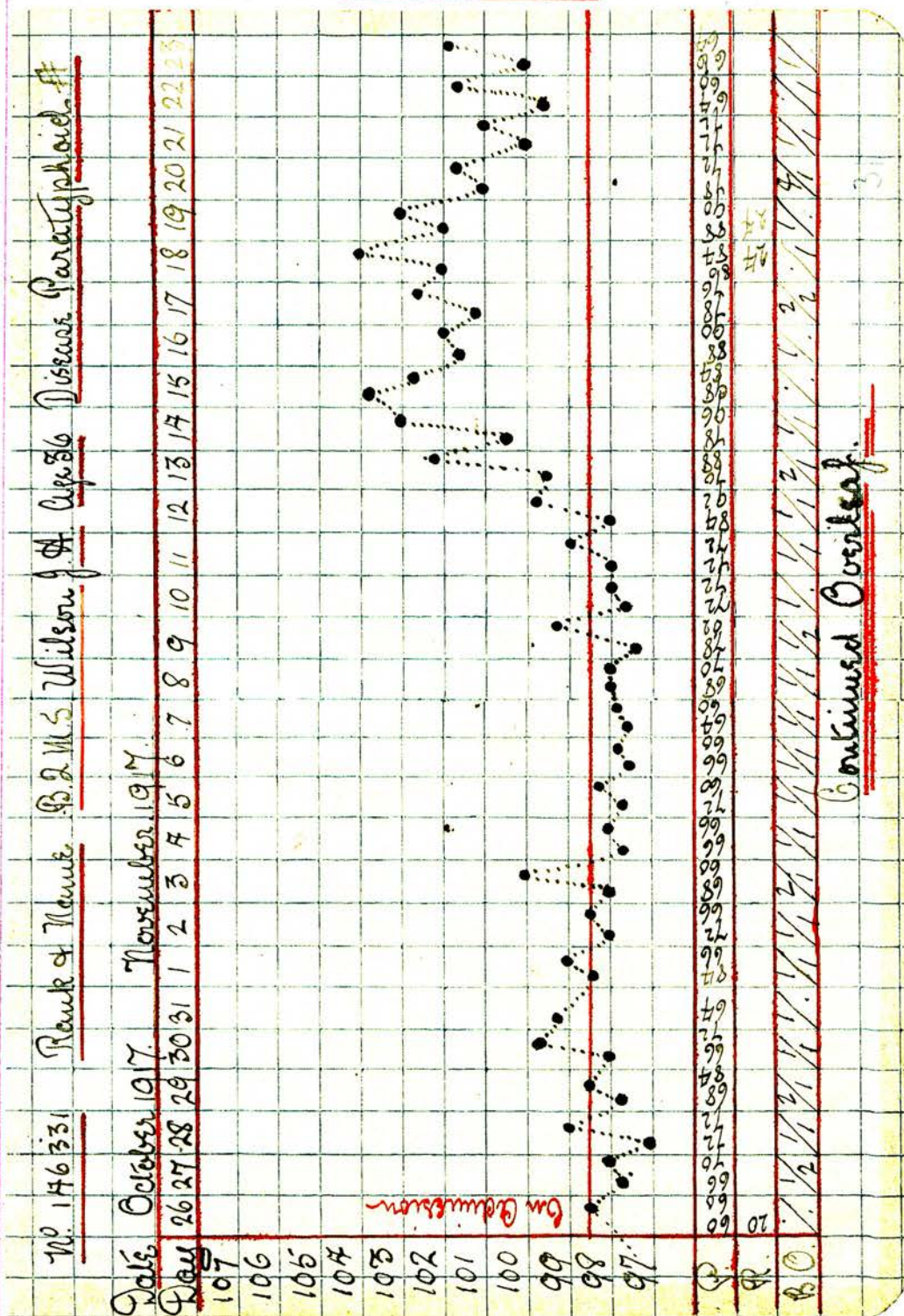
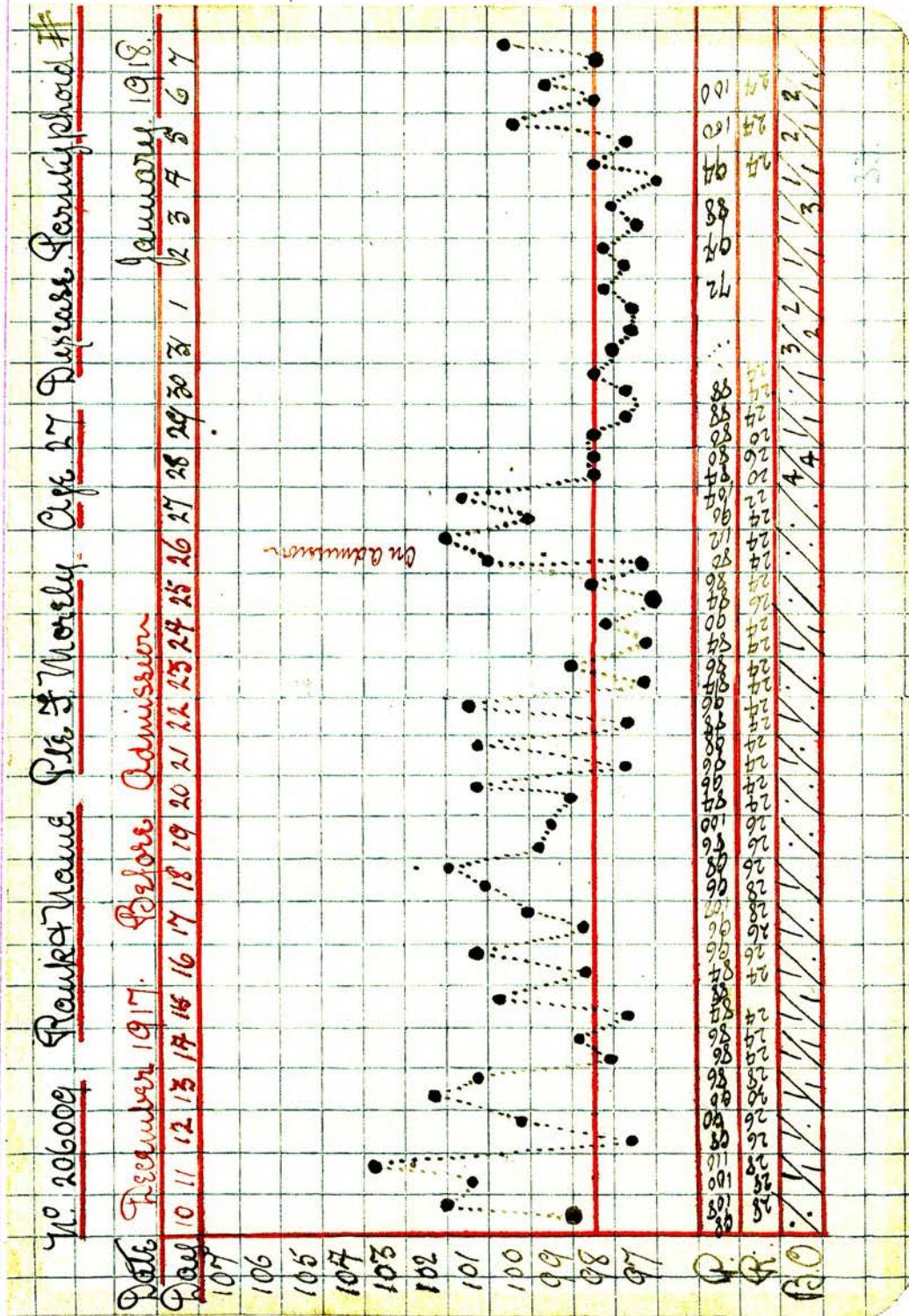


CHART 33.



A tabulation of the different bacteriological reactions of aforementioned members of Coli-Typhoid group, especially in regard to sugars, milk, indol formation, motility etc., is given hereunder.

	GLU- COSE	LAC- TOSE	SAC- CHAR- OSE	DUL- CITE	MANN- ITE	MAL- TOSE	DEX- TRIN
B. DYSENTERIAE.							
A. (Flexner)	Acid	nil	nil	nil	acid	acid	
B. (Shiga)	Acid	nil	nil	nil	nil	nil	nil or slight acidi- ty.
B. TYPHOSUS	Acid	nil	nil	nil	acid		
B. PARATYPHOID							
A.	(Acid (Gas	nil	nil	(acid (gas	(acid (gas	(acid (gas	
B.	(Acid (gas	nil	nil	(acid (gas	(acid (gas	(acid (gas	
B. COLI.	(Acid (Gas	(acid (gas	nil	(acid (gas	(acid (gas	(acid (gas	

	MILK	INDOL	MOTILITY	McCONKEY.
B. DYSENTERIAE				
A. (Flexner)	Acid → alkaline	+	Non motile	Translucent)
B. (Shiga)	Acid → alkaline	Nil	Non motile	Colourless Colonies.)
B. Typhosus				
	No clotting. Acid permanent acidity	Nil	+	Translucent) Colourless Colonies)
B. PARATYPHOID				
A.	Permanent acid	Nil	+	Translucent) Colourless)
B.	Acid → alkaline	Nil	+	Colonies)
B. COLI.				
	Acid. Clot.	+	+	Red Colonies.

After Henderson Smith Vide B.M.J. July 3rd
1915.

D. TYPHUS FEVER.

A number of cases of this disease occurred in the Mediterranean area and at one time it was prevalent in the prison camps in Germany.

This is a lice borne blood infection, accompanied by severe toxæmia involving heart and nervous system in particular.

The temperature rises slowly, reaching its highest level on the fourth day, when the rash appears. The temperature reached is usually 102° F.-104° F. There is no morning remission; in a few cases a false crisis occurs between 7th - 11th days, the true crisis usually being gradual and covering several days, begins about the 14th day. Hyperpyrexia in lieu of a crisis about this time, is of grave significance.

In cases with a remittent temperature, cardiac trouble is to be expected.

DIFFERENTIAL DIAGNOSIS.

- (1). Typhoid and Paratyphoid Fever. In these the onset is more insidious, the pupils are dilated and there is no injection of conjunctivæ occurring in bands and extending from the canthus to the cornea, as is seen in Typhus/

Typhus. Differences may also be noticed in appearance of patients, in rashes and morning temperature.

- (2) LOBAR PNEUMONIA.
- (3) INFLUENZA
- (4) CEREBRO-SPINAL MENINGITIS.
- (5) FADING MEASLES.
- (6) RELAPSING FEVER.
- (6) PLAGUE.
- (8) SEPTICAEMIA.

E. CHOLERA.

In 1914 outbreaks occurred at Smyrna, and at Beirut, in 1915, Cholera occurred among the large bodies of troops encamped in the Gallipoli peninsula. From 1914-1917 Egypt had no prevalence of Cholera, but there were some cases in two vessels on their way from Eastern ports to Europe, and in 1917 cases of Cholera were reported in Egypt among troops and prisoners of war from Palestine, but the numbers were small.

FRANCE (1914-1917) remained free from Cholera except that a few cases occurred at Marseilles in 1916, due to infection brought on shipboard to that port by Serbian refugees.

ITALY (1915). Cases occurred at Leghorn and Venice, the infection having been conveyed to Italy by Austrian prisoners of war.

In regard to temperature during the collapse stage, in the axilla or mouth it may be 5-10° below normal, whereas in the rectum it may be 103°F.

In malignant forms 'it begins where other diseases end - in death'.

Bacteriological diagnosis is of considerable importance.

DIFFERENTIAL DIAGNOSIS.

- (1). Bacillary Dysentery (Q.V.) c serous stool.
- (2). Amoebic Dysentery. Co-existence may occur.
- (3). Pernicious MALARIA.
- (4). Cholera nostras.
- (5). Putrid and mushroom poisoning.
- (6). Irritant poisons of metals.
- (7). Early trichinosis.

F. RELAPSING FEVER.

The old famine fever was very common in Egypt and Palestine and is lice borne; recent research has elucidated the infective agent in Palestine as being the tick *Argas persicus*. Transmission by bed bugs and fleas has received attention.

There are several forms of this disease but only the Palestine form will be mentioned here.

The diagnosis made in forward areas was usually Malaria or P.U.O.

During/

During an attack the temperature rises rapidly to 100-106° F. (usually about 103°F.), this temperature lasts for 2-4 days and ends by crisis, relapses after 6-12 (usually seven) days were common if kharsivan given intravenously in 0.6g doses was not utilized. If given in pyrexia or shortly after the initial fever relapses were usually prevented.

In the apyrexial period, the patient usually feels well and when the relapse occurs, the symptoms of the onset of the disease are imitated. The temperature rises rapidly to its maximum and usually lasts a day. In later relapses the apyrexial period tends to be increased in duration. Relapses after 14 days seldom occurred, still more seldom after 21 days of apyrexia, and if patient has been afebrile for 28 days, a relapse is highly improbable.

The maximum incidence is from December to April (cold season).

The bacteriologist again comes to our aid in this disease and from a blood examination, supplemented, if necessary by a differential blood count, valuable information is obtained. The detection of the spirochaetes in the blood during the paroxysm, clinches the diagnosis of relapsing fever but does not exclude the coexistence of plague or typhus. In relapsing/

relapsing fever, the presence of an increase of large mononuclear cells is a constant feature in the Palestine form of the disease, not so in the European variety of the fever.

Malaria and dysentery are known to co-exist with Relapsing Fever.

DIFFERENTIAL DIAGNOSIS.

RELAPSING FEVER.

This introduces one to a wide field of diseases.

- (1) MALARIA. In relapsing fever of the Palestine variety, splenic enlargement is rare. Quinine has no effect in relapsing fever. The presence of malarial parasites in the blood and tertian periodicity are of significance. A patient with relapsing fever is more acutely ill, enlargements of a painful liver is very common, with severe headache and vomiting.

It ought to be noted that an increase of mononuclear leucocytes is found, as a rule, in chronic malaria.

- (2) TYPHUS & TYPHOID FEVER. Bacteriological aid is again of great importance. The presence of spirochaetes, Löwenthal's agglutination reaction for relapsing fever, and so on.

Typhus and typhoid rashes assist in diagnosis/

diagnosis at a later date, also blood tests, such as Widal, Weil-Felix and others. In regard to rashes in dealing with Coloured troops, difficulties arise, and natural mottling is also common.

A leucocytosis occurs in relapsing fever, a leucopenia in typhoid. Pin point pupils seen in typhus are the exception in spirochaetosis.

(3) MEDITERRANEAN YELLOW FEVER. (Weil's Disease).

As jaundice, often mere conjunctival, is relatively common, as a complication of relapsing fever, spirochaetosis ictero-haemorrhagica must be considered in differential diagnosis. In relapsing fever the jaundice may be a severe complication, accompanied by haematemesis and with a fatal issue.

(4) DENGUE or BREAK-BONE FEVER, - usually accompanied by a leucopenia (cf. spirochaetosis), and reduction in polymorphs, bradycardia and a measly or scarlatiniform rash. Relapses do not usually occur.

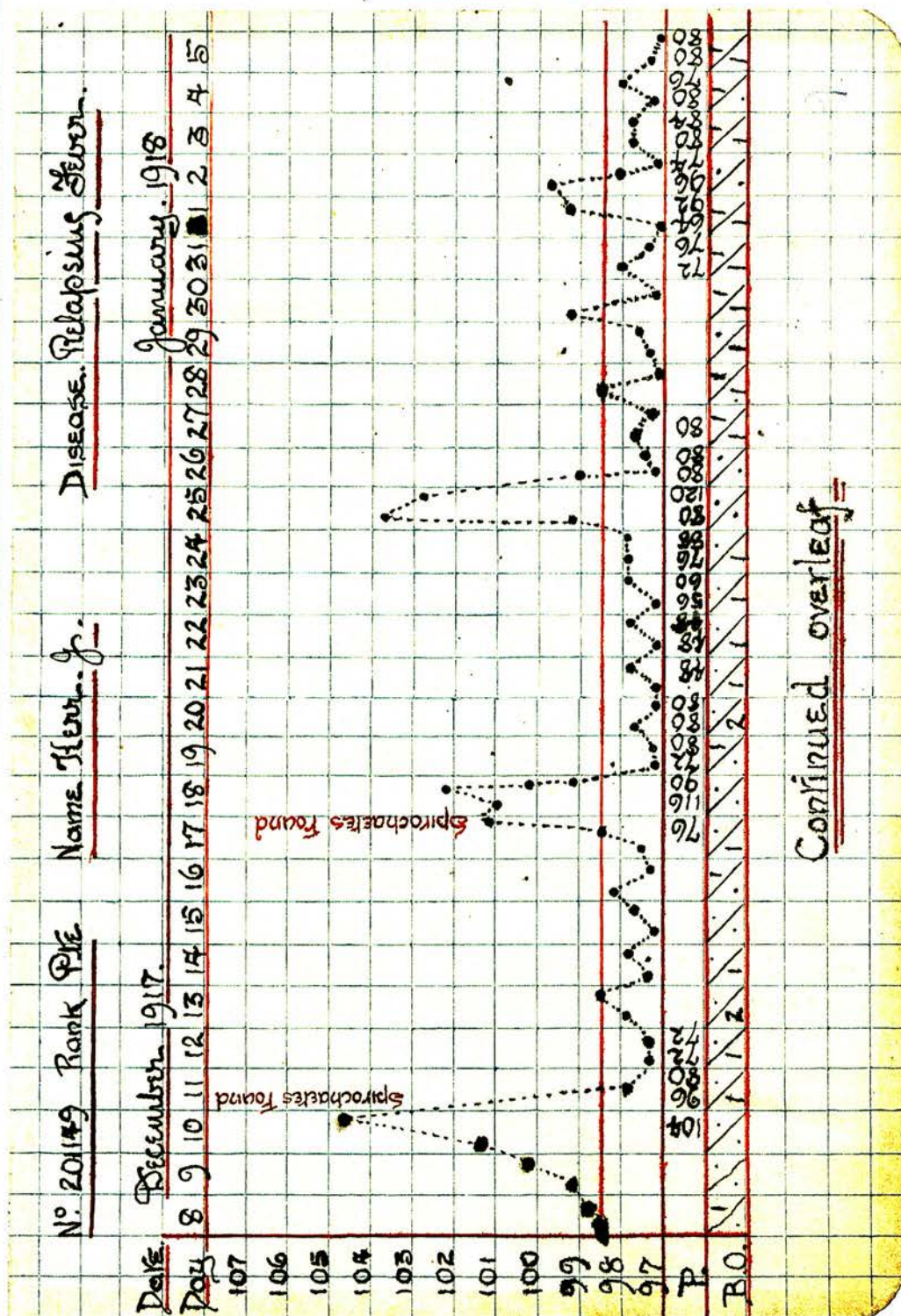
(5) AFRICAN TICK FEVER, - usually occurs in warm season. Generally accompanied by splenic enlargement, dysentery and eye complication.

(6) PNEUMONIA, - leucocytosis more marked, presence of herpes and physical signs aid one in differentiating.

(7)/

- (7) CEREbro-SPINAL FEVER: Stiffness of the neck, hyperaesthesia, cerebral symptoms and delirium may all be present at the onset of relapsing fever. Blood examination and lumbar puncture are aids.
- (8) TRENCH FEVER: uncommon in Palestine, but troops may have been in Western areas and had the disease there, or may have brought the infection from West to East. Shin pains are characteristic of Trench Fever. Punctate basophilia of the erythrocytes is a common feature.

CHART 9.



C H A R T 11.

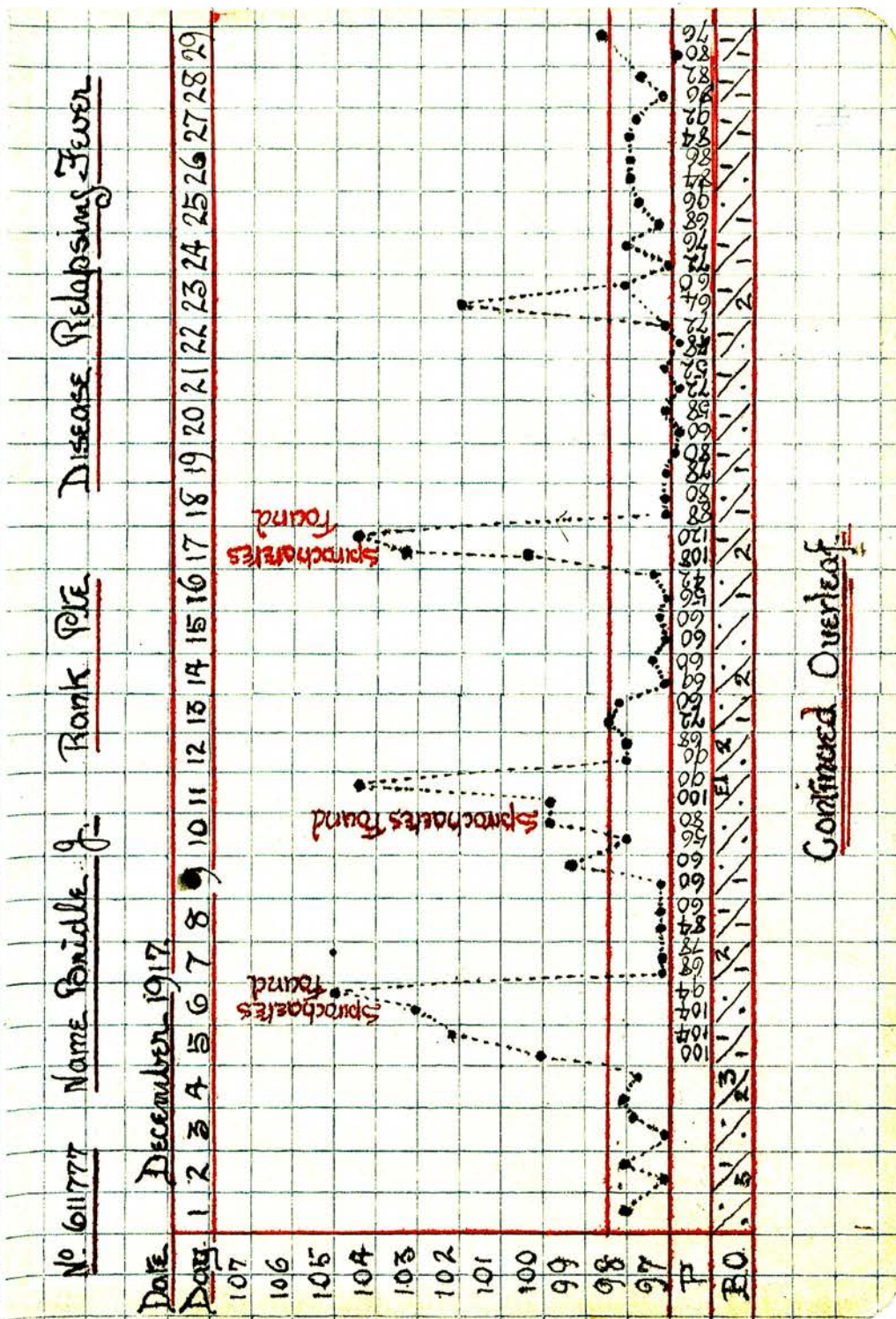
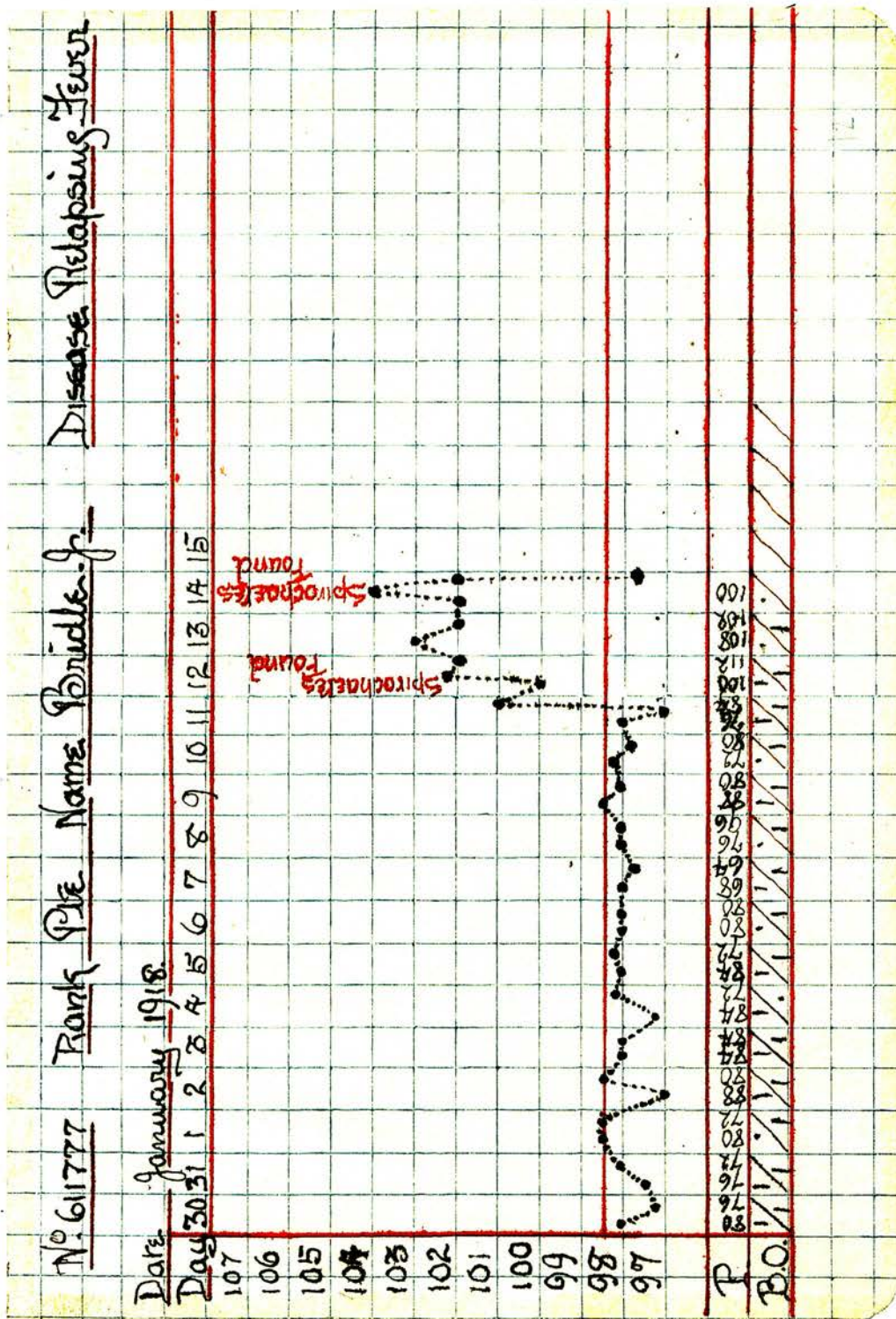


CHART 12.



C H A R T 1 3 .

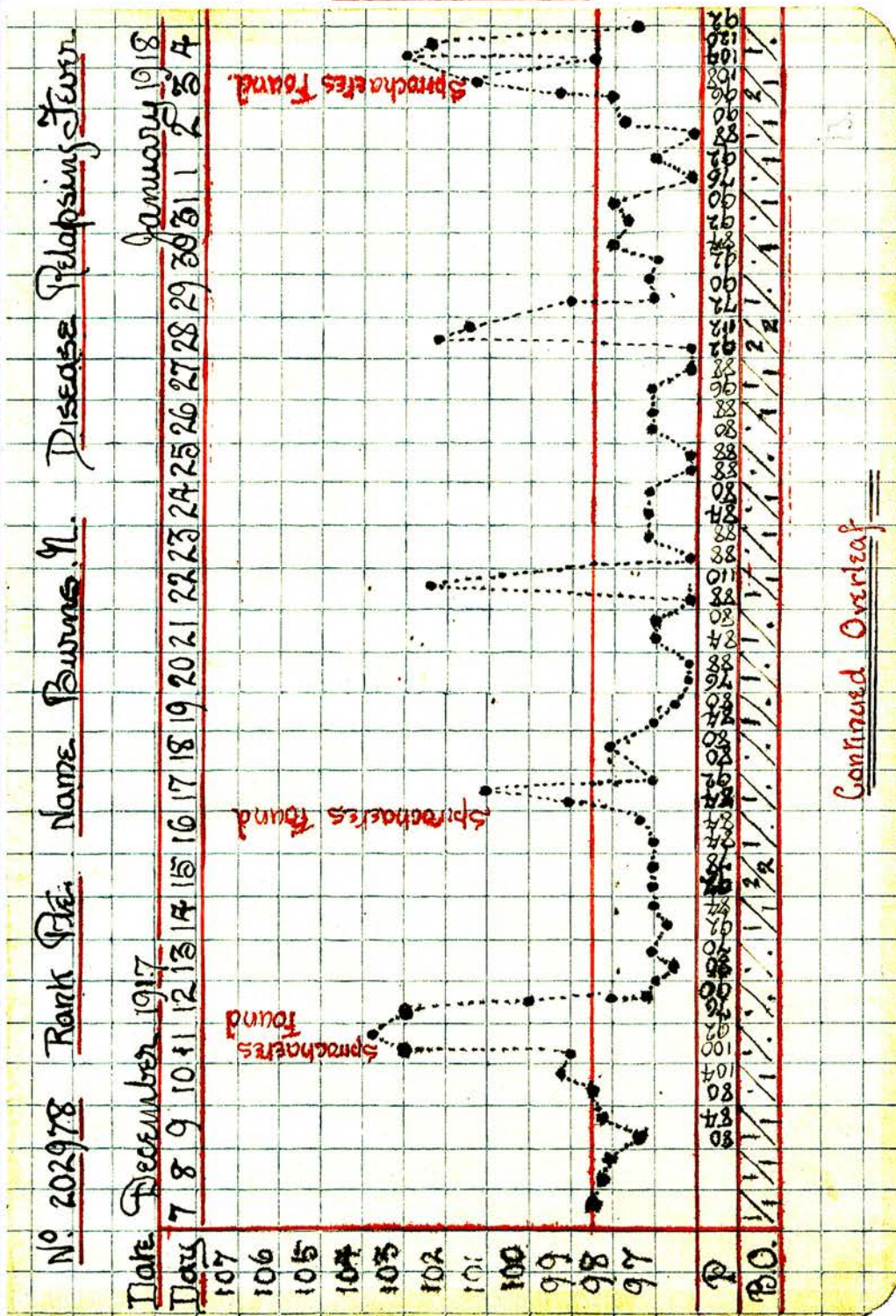


CHART 14.

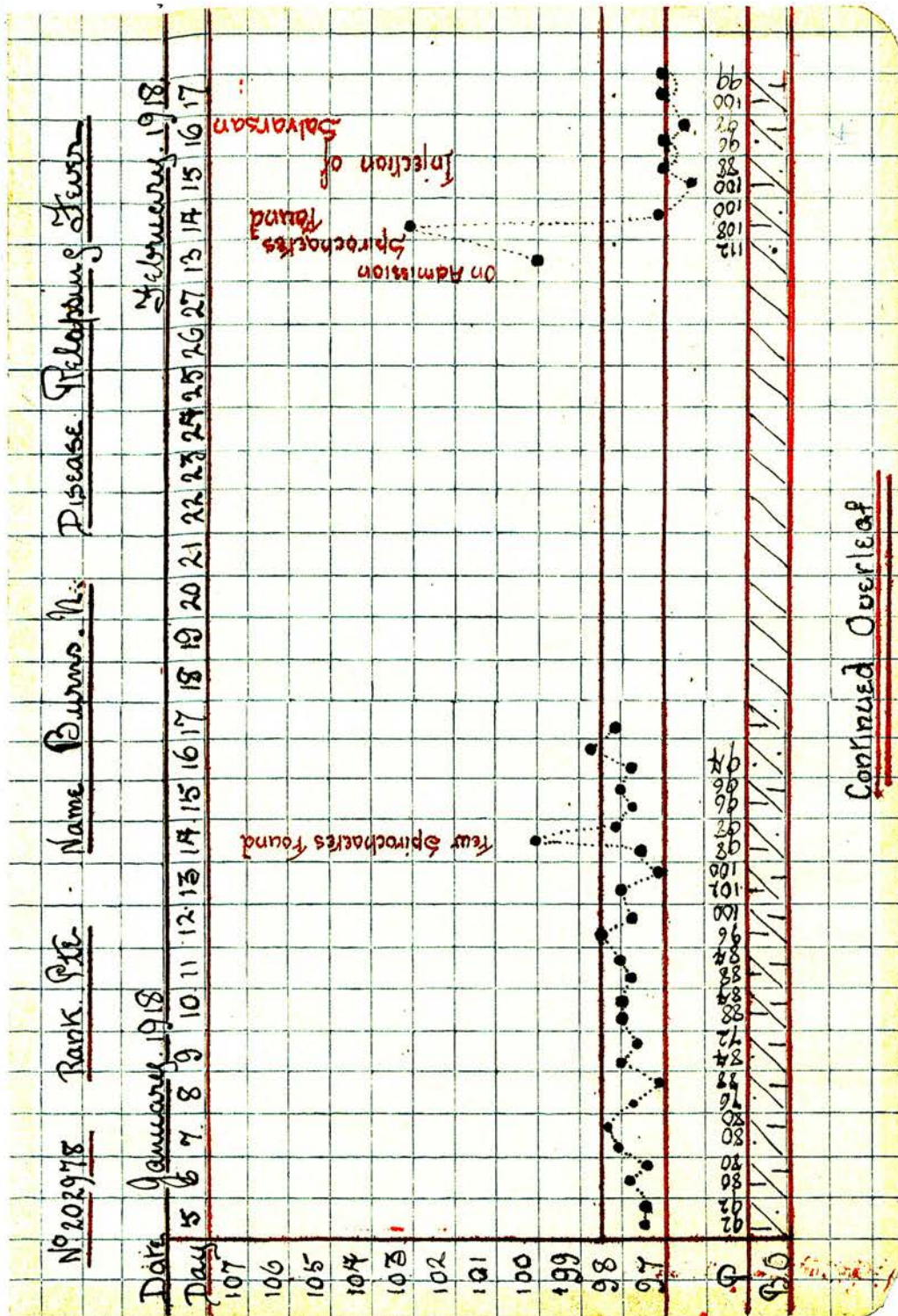
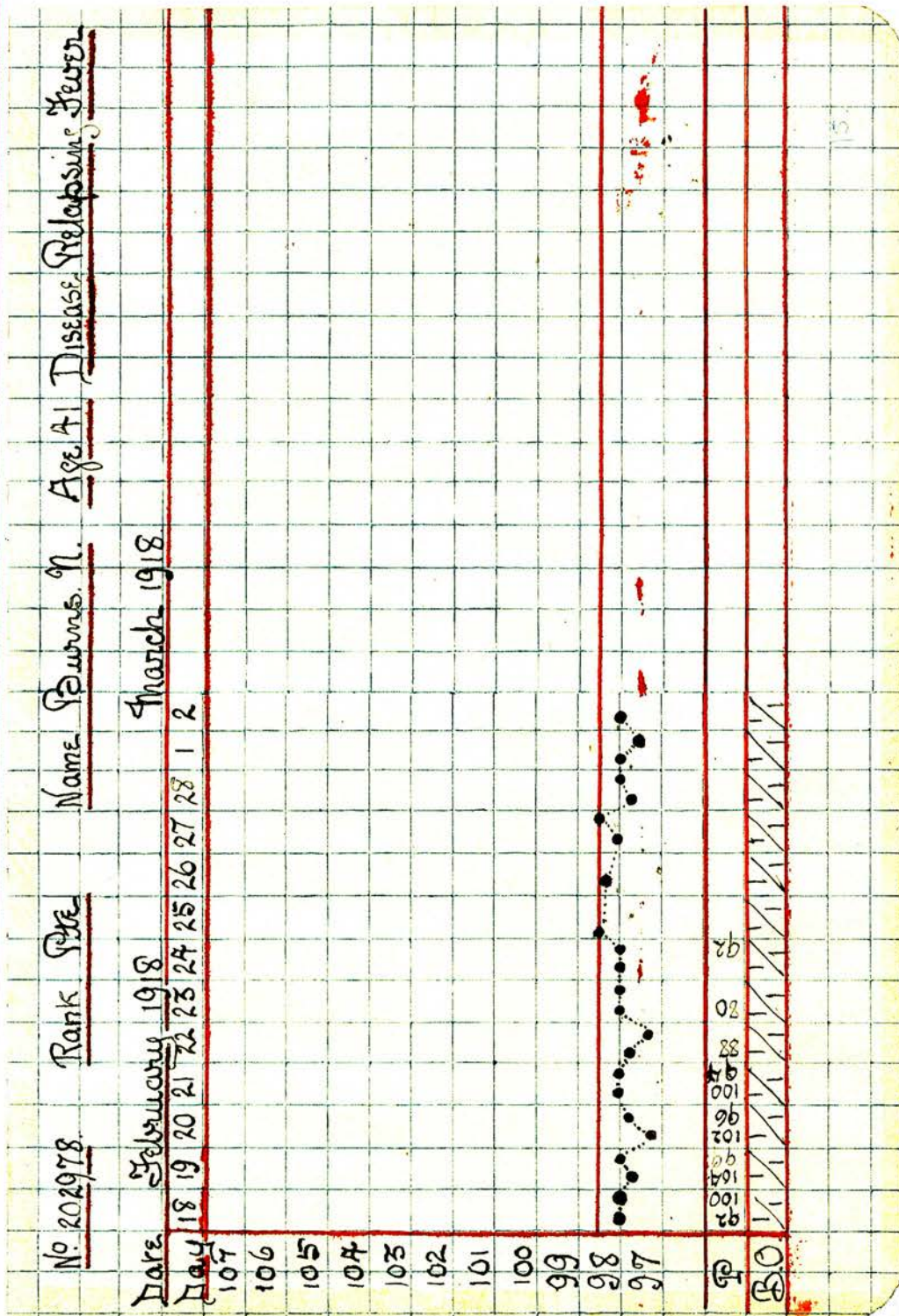


CHART 15.



C H A R T 16.

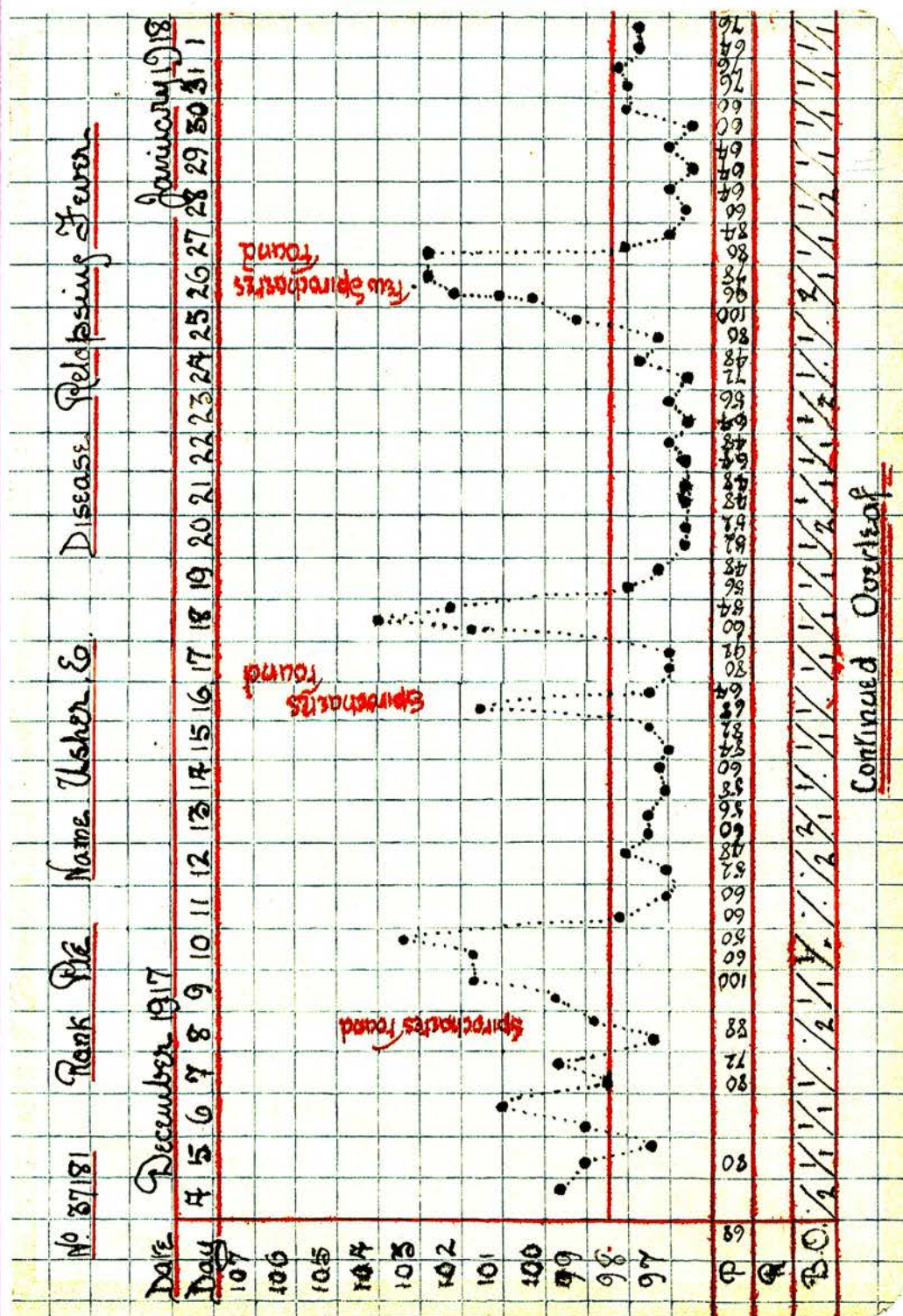


CHART 17.

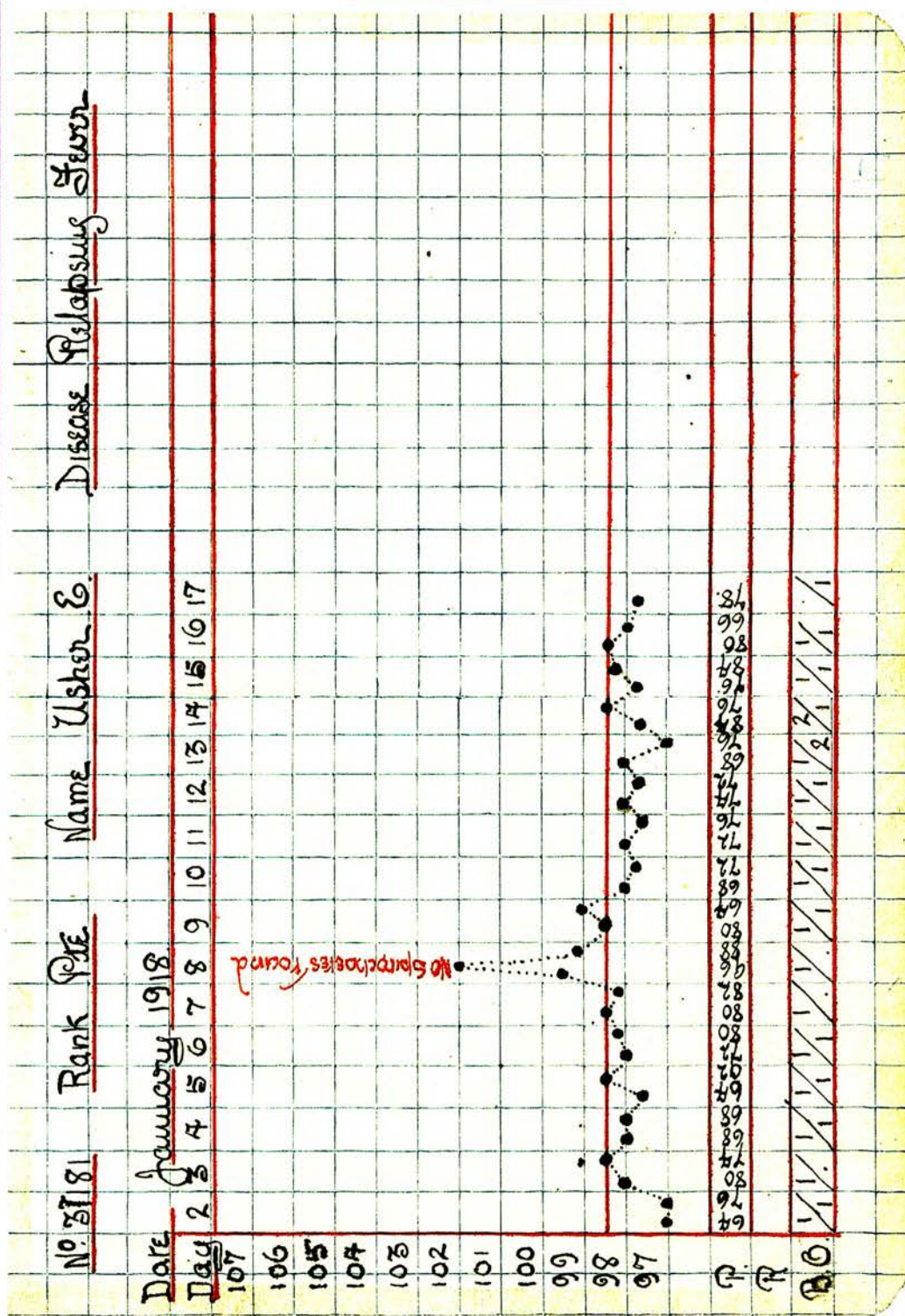


CHART 18.

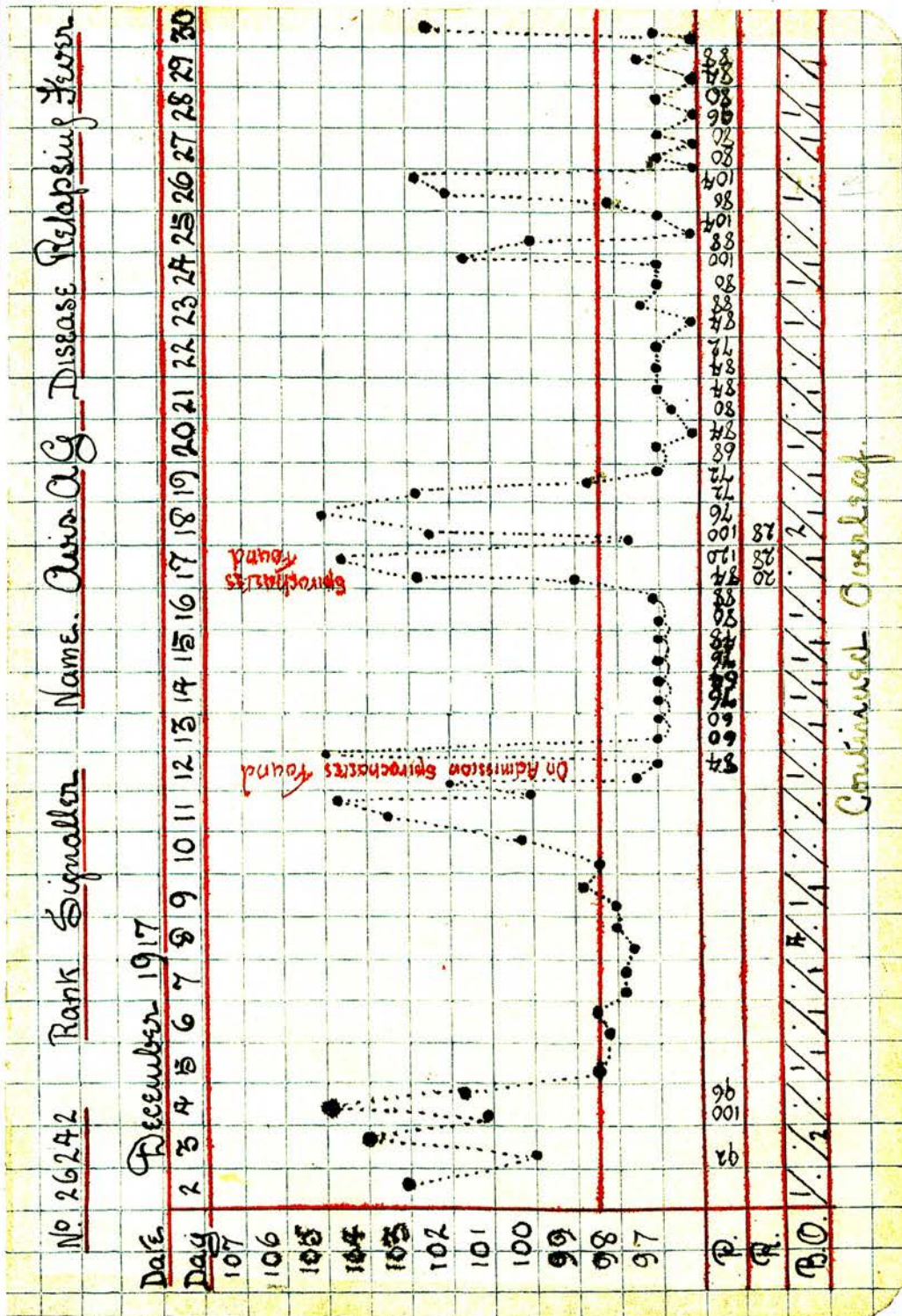


CHART 19.

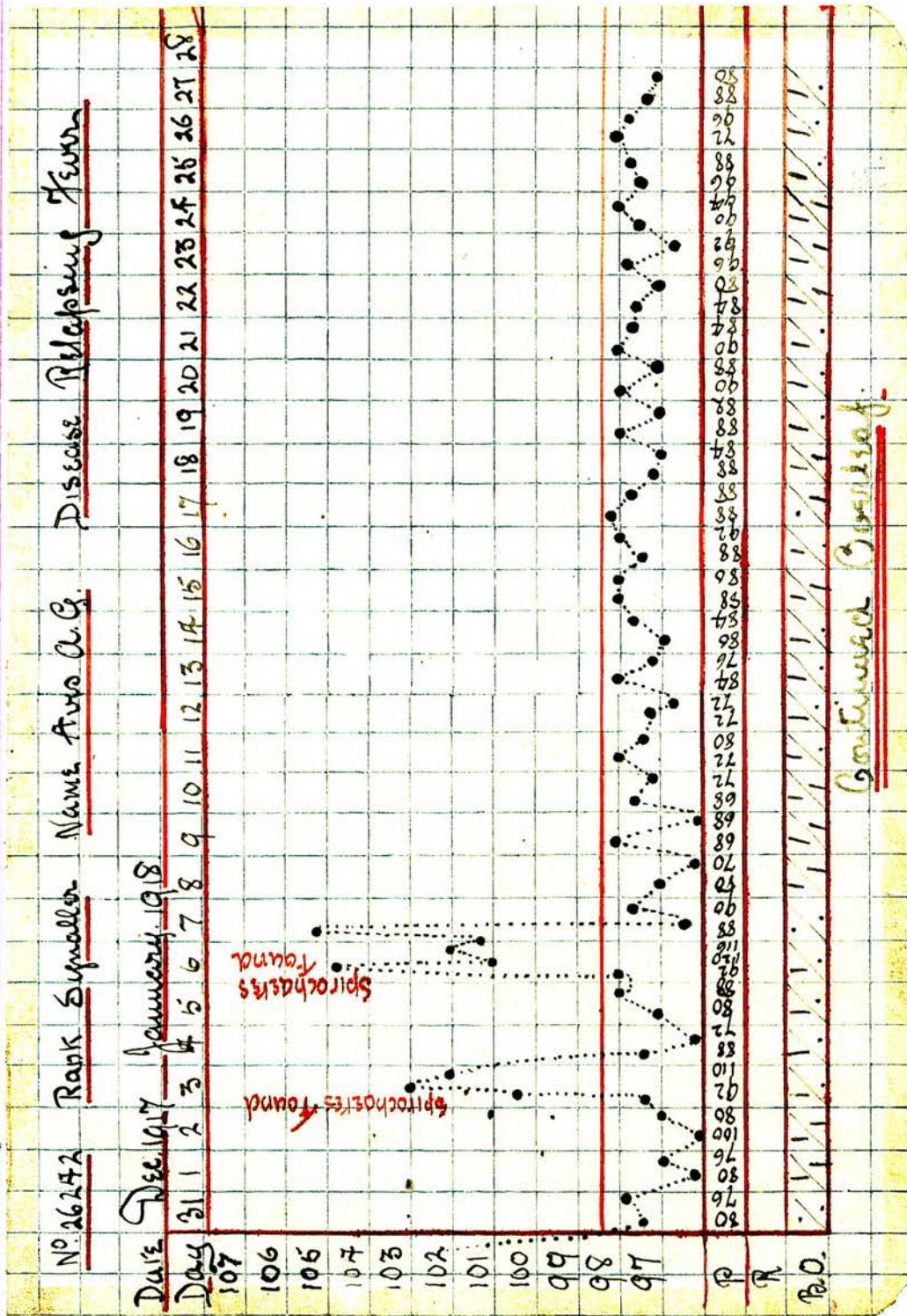
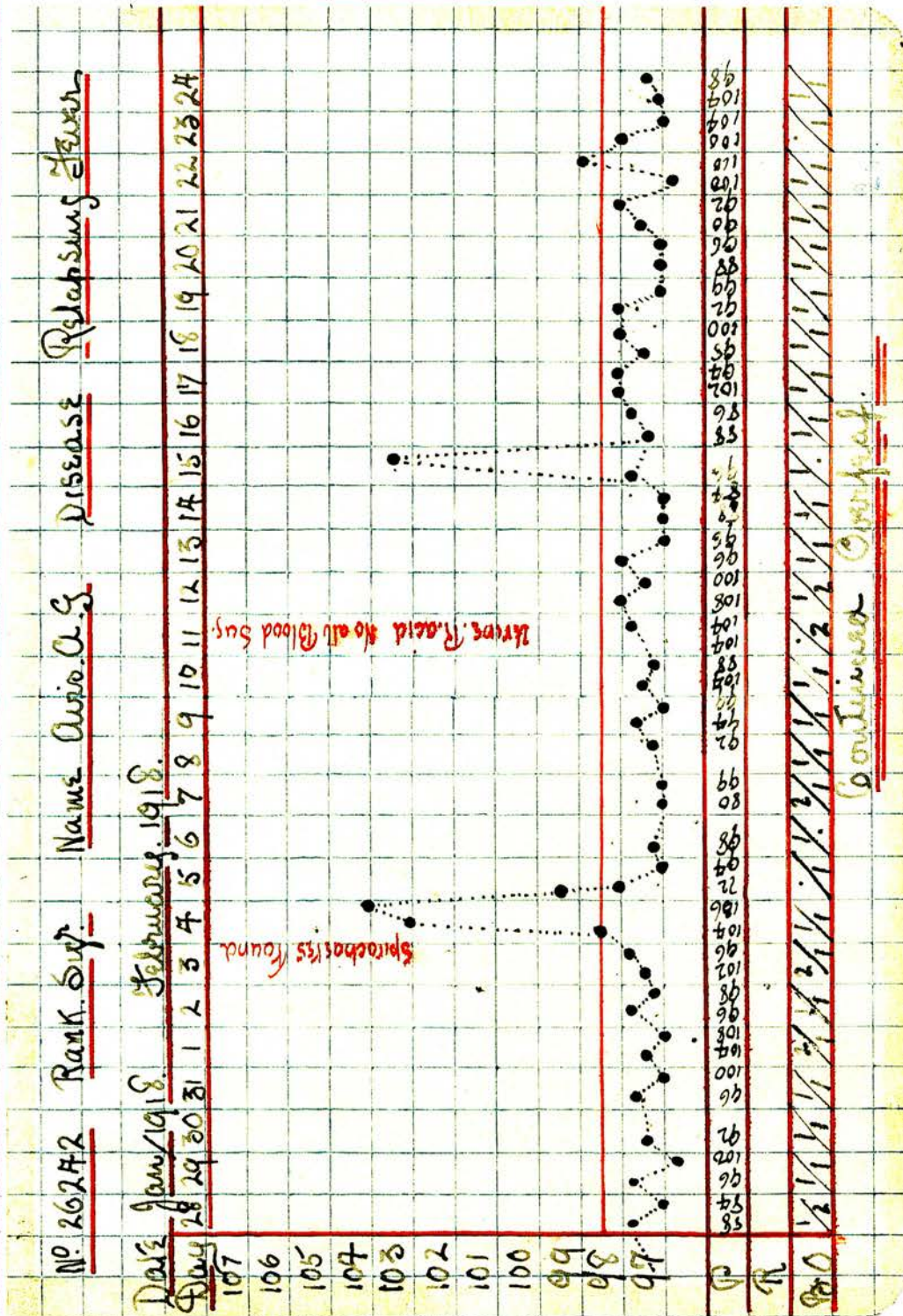


CHART 20.



N ^o 26242	Rank Sign ^r	Name Curio A. G.	Disease Relapsing Fever
----------------------	------------------------	------------------	-------------------------

Name Caro A. G. Disease Relapsing fever

Rank Sign:

Nº 26242

Date	February 1918.	March 1918.
Day 25	28	1
Day 26	27	2
Day 27	26	3
Day 28	25	4
	24	5
	23	6
	22	7
	21	8
	20	9
	19	10
	18	11
	17	12
	16	13
	15	14
	14	15
	13	16
	12	17
	11	18
	10	19
	9	20
	8	21
	7	22
	6	23
	5	24
	4	25
	3	26
	2	27
	1	28

March 1918.

February 1918.

Date

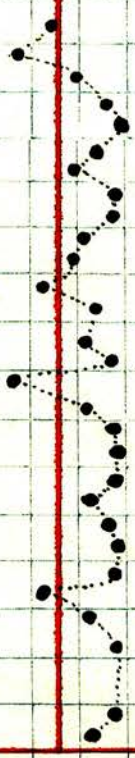
Day 25 26 27 28 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

Day 25

No Spiracles Found

No spiracles found.

Headache Cold



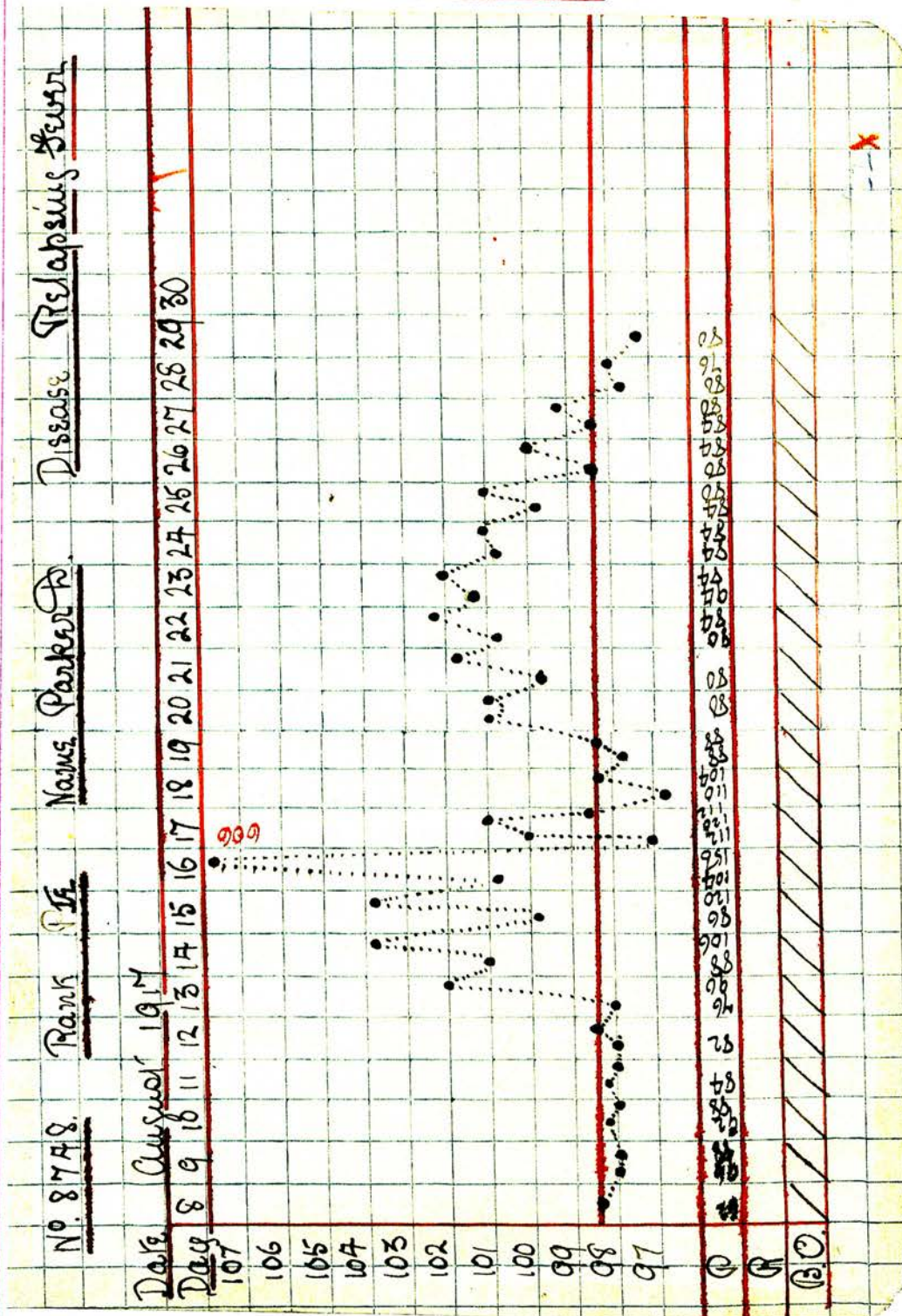
0.2
0.2
0.4
0.6
1.4
9.2
10.0
9.6
9.6
9.6
10.4
10.8
10.4
1.1
10.1
1.8
8.4
8.8
10.4
1.0
2.6
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2.8
2.8
4.7
8.2
10.4
11.2

[illegible]

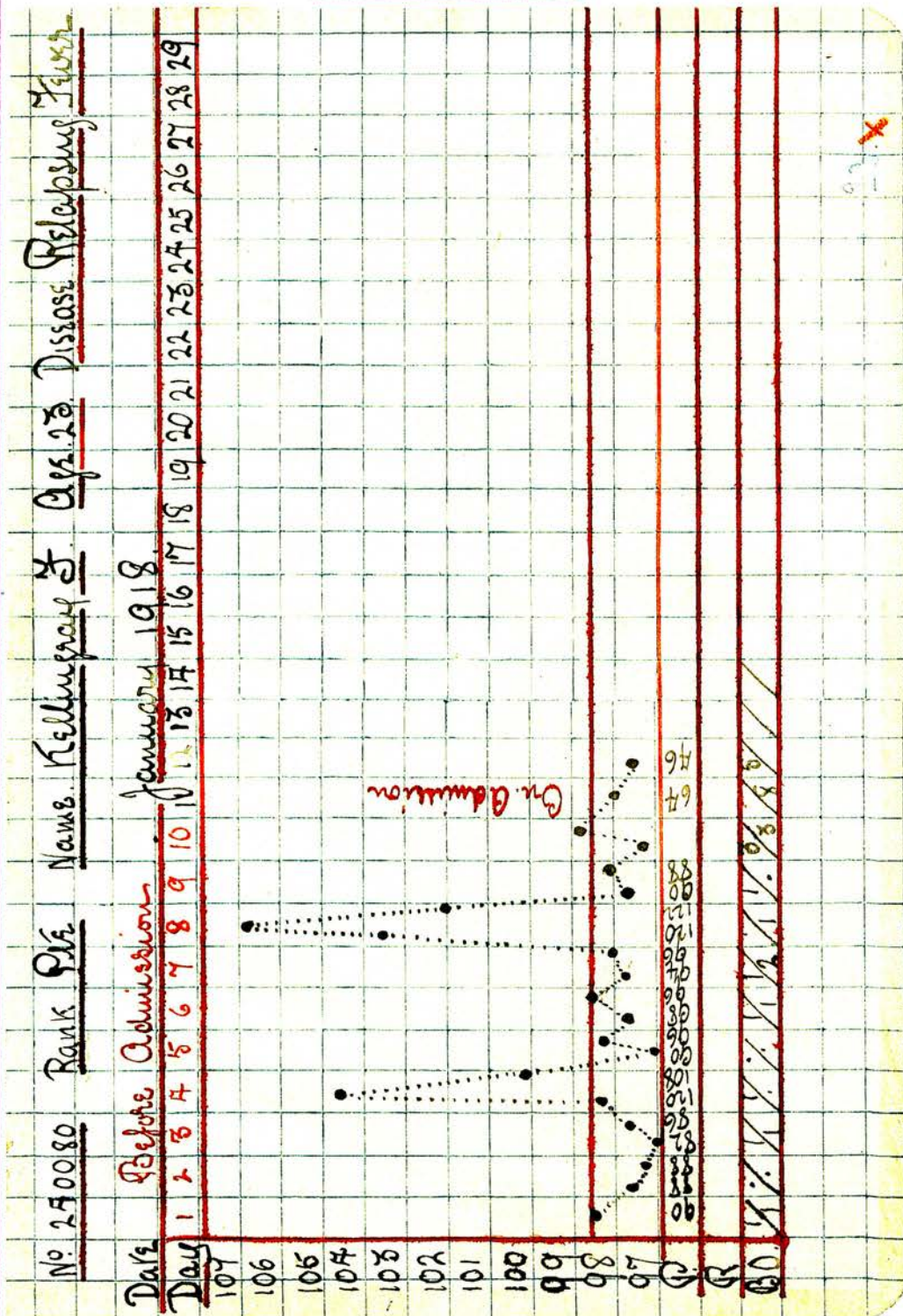
3
 2
 1

2

CHART 22.



C H A R T 2 3 .



C H A R T 2 4 .

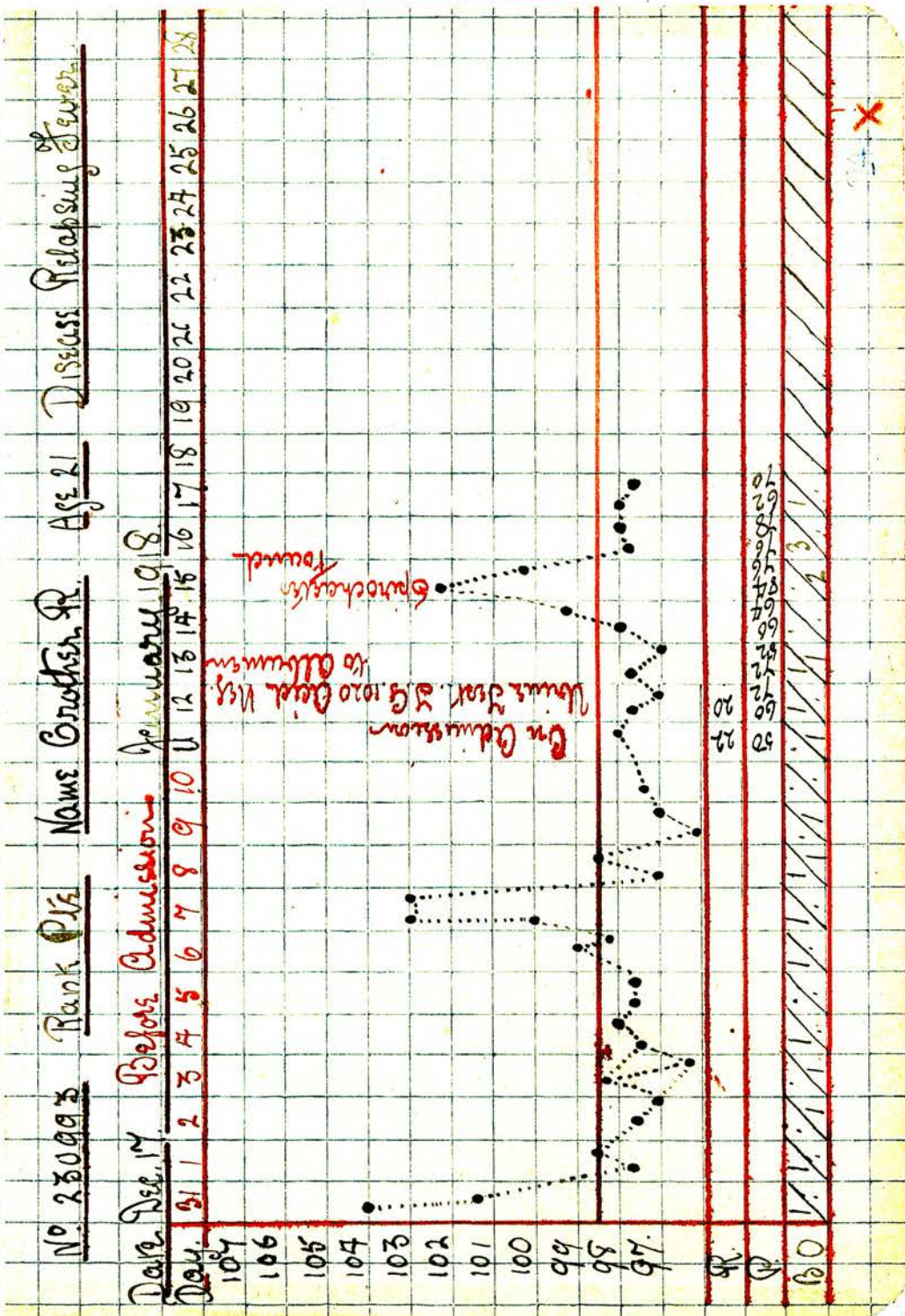
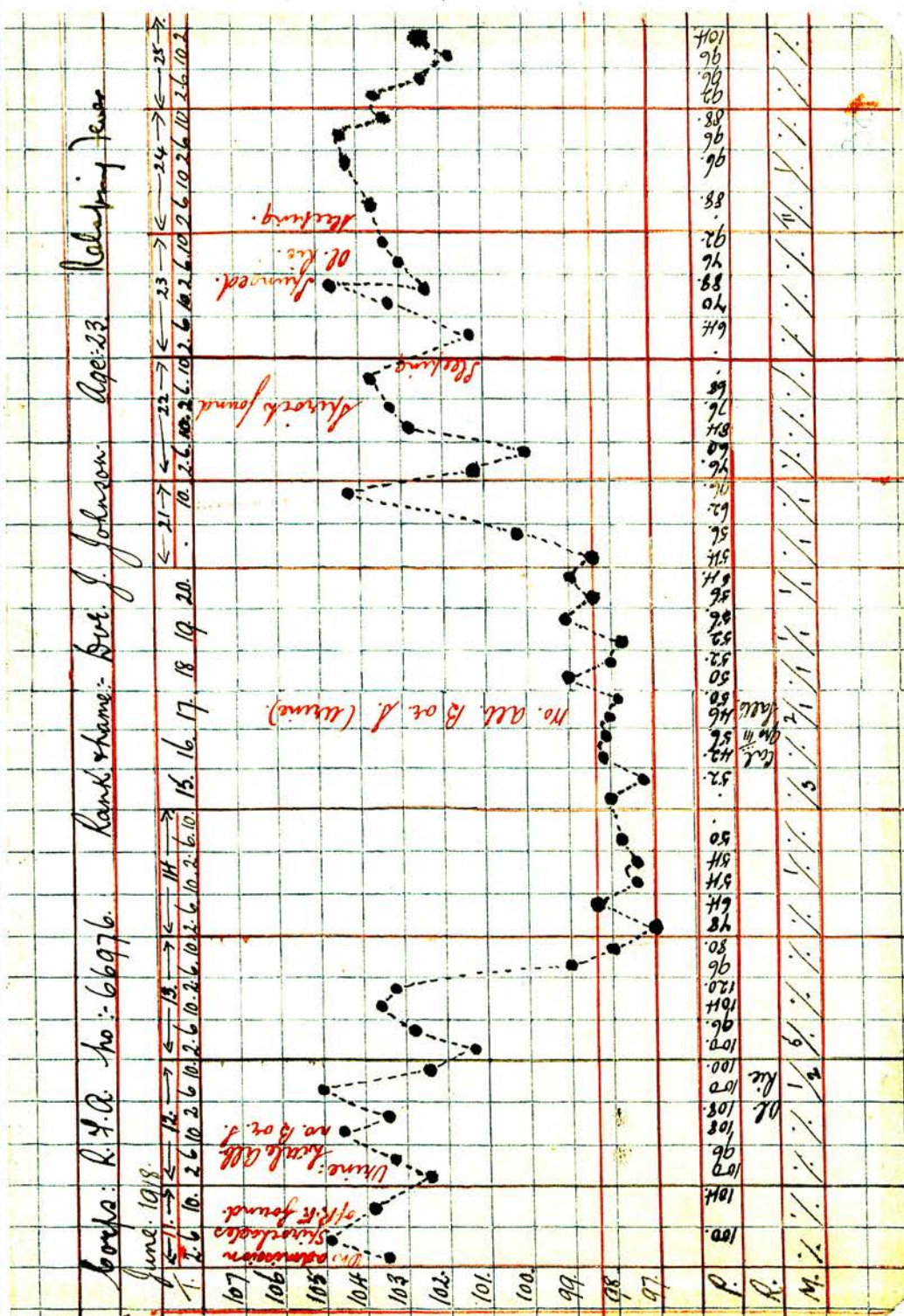


CHART 38.



G. MEDITERRANEAN FEVER.

Occasional cases of this long continued fever occurred in Mediterranean areas, necessitating invaliding to England.

At one time prior to 1906, the disease had a marked incidence among the troops in Malta, with considerable loss to the state. Malta was then looked upon as one of the most unhealthy of foreign stations.

Owing to the precautions taken with goat's milk, the disease practically disappeared from the troops. Goats harboured the causal organism micrococcus melitensis and excreted it in their milk.

The onset of the fever is accompanied by a remittent type of temperature which suggests Enteric, after a zigzag rise, occupying about four days, the temperature comes down slowly, reaching normal in about ten days from commencement.

Relapses are characteristic, pyrexia occurring at intervals, and the course of the illness may last twelve months. There is an intermittent form of Malta fever, with slight evening rise and the morning temperature is normal or subnormal, phthisis being suggested.

DIFFERENTIAL/

DIFFERENTIAL DIAGNOSIS.

The best method of diagnosis during life is the agglutinative test. The reaction is analagous to serum test for Typhoid fever.

- (1) Typhoid and paratyphoid, especially at onset of fever.
- (2) Malignant Malaria.
- (3) Influenza.
- (4) Liver Abscess.
- (5) Kala-azar.
- (6) Phthisis, especially simulated by intermittent form of fever, accompanied by night sweating and emaciation.

From the point of view of diagnosis and differential diagnosis, the extreme value of laboratory aid is obvious.

H. DENGUE

A number of cases of this disease occurred in Egypt and elsewhere.

After an incubation period of a varying number of days, the temperature rapidly shoots up to about 105° F., and is soon followed by a rash, which may be missed. The temperature may remain elevated for about 4 days, falling perhaps to normal and then remains there for 1-3 days, only to rise again. This rise/

rise is usually accompanied by a rash. As a rule the fever soon abates.

The initial rash, which is transient, may resemble scarlet fever, and is usually found on face and extremities, the later rash is measly and affects extremities.

In seven days, fever which is classed as Dengue, there is usually a continuous temperature, with no fourth day remission. The rashes may be absent altogether.

A leucopenia accompanied ^{true} the Dengue, with a reduction of polymorphs.

DIFFERENTIAL.

1. INFLUENZA. In this disease the pulse is usually faster, no rash appears and respiratory system commonly involved. There is no doubt that at the onset of Dengue, influenza is closely resembled.
2. SAND FLY FEVER. In atypical forms the two diseases resemble each other. Infection of the conjunctivae and absence of rashes help in diagnosis. The Temperature Chart may assist.
3. SPIROCHAETOSIS-ICTERO-HAEMORRHAGICA. Here we usually have Albuminuria early on, which is uncommon in Dengue.
4. EARLY TYPHOID or PARATYPHOID.
- 5./

5. MALARIA.
6. SCARLATINA or MEASLES. EARLY SMALLPOX.
7. MYALGIC CONDITIONS.
8. RELAPSING FEVER. Vide ante.

I. JAUNDICE, including MEDITERRANEAN YELLOW FEVER.

This subject might easily, in itself, form the subject matter of a lengthy treatise, the icteric tint of the patient obviated the necessity of the diagnosis P.U.O., and the enormous varieties of differences in temperature in different cases, need only necessitate mention.

In general a large number of the cases seen in the Mediterranean Areas, were secondary to Coli-typhoid infections, malaria and relapsing fever. The primary condition ought always to be sought and investigated, and the co-existence of diseases never overlooked.

Transient cases of jaundice were by no means uncommon and were put down to chills, dietetic indiscretions and such like causes.

Two other forms of jaundice may be mentioned, one Toxic or Epidemic Jaundice, the other Spirochaetosis ictero haemorrhagica or Weil's disease.

The former has been said to be due to *B. proteus*/

proteus fluorescens, the latter is due to a specific spirochaete which may be isolated from the urine during 5-6 weeks from date of onset. Cases of this disease have occurred in Mediterranean areas, on French and Italian fronts. It has been stated that 30% of trench rats in France, have the spirochaete in their kidneys without apparent injury to their health. Weil's disease is differentiated from Blackwater Fever by the presence of haemoglobinuria in the latter condition.(q.v.)

J. PLAGUE.

There are three varieties of this disease, cases of which are by no means uncommon in Egypt. During the years 1914-1917, it is stated that 2,889 cases of Plague occurred in Egypt, with 1,458 deaths. This includes civilian population, and I have not been able to ascertain the numbers of cases occurring among the troops. The varieties are Bubonic, Pneumonic and Septicaemic. The fever is, as a rule, irregular, and death, especially in the two latter varieties, very often occurs.

DIFFERENTIAL DIAGNOSIS.

- | | | |
|----|--------------------|-----------------------|
| 1. | Typhus Fever | |
| 2. | Venereal Bubo |) Bubonic Plague |
| 3. | Typhoid Fever | |
| 4. | Influenza |) Pneumonic Plague. |
| 5. | Relapsing Fever | |
| | |) Septicaemic Plague. |
| 6. | Malignant Malaria) | |

In/

In regard to Pneumonic Plague during the prevalence of influenza, it is quite possible for the disease to be missed, as occurred in the case of S.S. Friary (1901) where the disease proved to be pneumonic plague, B.pestis being recovered from the lung tissue sputum &c., and the condition was diagnosed as - "influenza, with lung complications". The case of S.S.Nagoya (1919) is probably more fresh in our minds, here, too, the original diagnosis was influenza and bacteriological proof was produced to show that the disease, in fact, was pneumonic plague.

K. HEAT STROKE.

Alcoholism and a high relative humidity of the atmosphere are important factors.

In diagnosis Cerebral Malaria is the most important consideration, the onset may simulate Cerebro spinal fever in its initial stages.

L. SCURVY.

In the Crimean War, the Turkish Army was nearly destroyed by Scurvy, and there were 40,000 Cases in the Allied British and French Armies.

The disease is accompanied by a certain amount of Pyrexia, but the diagnosis is not, as a rule, difficult, taking into consideration the state of the gums, the characteristic haemorrhages and other symptoms.

M. ANCHYLOSTOMA DUODENALE.

This worm occurs in Egypt, and may account for "P.U.O." An eosinophilia and discovery of the ova in the stools render the diagnosis fairly simple.

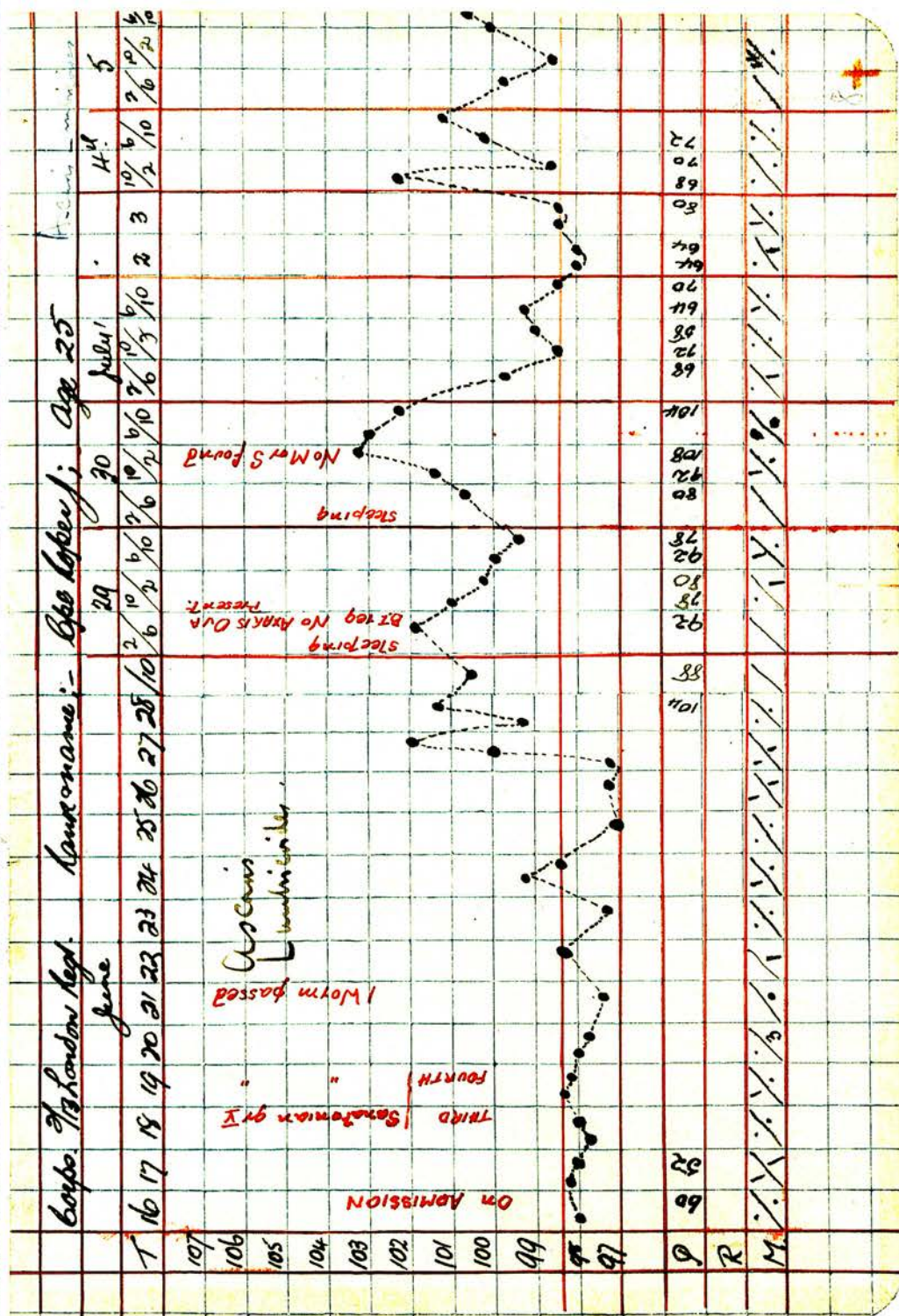
N. ASCARIS LUMBRICOIDES.

This nematode lurks in the upper part of the small intestine, and in two interesting cases which came under my observation, it certainly played a part in producing irregular pyrexia & diarrhoea, over a period of about two-three years.

Two privates of the 2/10 Middlesex Regiment had a history of chronic diarrhoea, for which they had both frequently been in Hospital on the Peninsula, in Egypt and in Palestine. The bacteriological diagnosis of dysentery was never made. Ova of Ascaris Lumbricoides were found in the stools, and with a course of Santonin a large number of worms were passed by the two respective patients, when no ova were found the diarrhoea had cleared up, and both were returned to duty. It would be interesting to know if ascaris lumbricoides alone had been responsible for this chronic diarrhoea which extended from September 1915 (Gallipoli) until July 1918 (Alexandria).

CHART/

CHART 8.



O. BILHARZIA.

This may be mentioned in passing; if it affects the intestine (*Schistosomum Mansoni*), a condition simulating chronic amoebic or bacillary dysentery is produced. The characteristic ova will be found in the faeces, a marked eosinophilia occurs in long continued cases, and the complement deviation affords some evidence.

C O N C L U S I O N .

The aforementioned diseases include some of the commoner conditions which we found among the forces in the Mediterranean Areas and such as Egypt and Palestine, in particular, which are associated with wide varying degrees of pyrexia and which took toll of the forces. Other diseases, which were associated with the European campaign, and of which cases occurred in the East, have yet to be considered, such as Cerebro Spinal Fever, Influenza, and others, as also such minor conditions as Chronic Tonsillitis, etc.

From a brief consideration of diseases A. to O., the obvious importance of diagnosis is clear. There can be no doubt that not infrequently every Medical Officer had cases of Pyrexia which baffled all./

all. One was apt to have "Tropical Disease", in the Mediterranean Areas, as the first thought, especially in cases where the diagnosis was, as often happened, by no means obvious. Disease, with concomitant pyrexia, such as might occur at home or in European Areas, always necessitated a most complete and thorough investigation.

As the late Dr. Gee said, Medicine has three parts: the first is diagnosis, the second is diagnosis, and the third is diagnosis. How true this allegory is!

Pulmonary tuberculosis, probably, above all diseases, was liable to be overlooked. Its prevalence amongst the troops serving in Egypt and Palestine is not unknown. Although such places as Helouan, Luxor and Assouan may be quoted as being healthy resorts for chronic cases, yet Palestine was not always "a land flowing with milk and honey".

Although cases of P.U.O., as previously mentioned, were normally admitted to the Medical side of a Hospital, subsequent transfer to the Surgical side was, by no means, uncommon. The Medical Officer must, accordingly, always be on the alert for surgical cases. As an example, one patient under my charge was sent in as P.U.O., N.Y.D. His temperature ran a most irregular course/

course and to commence with adopted a zig-zag course suggesting Typhoid Fever. After being in Hospital over a fortnight, his temperature was between 100°-102° F. for three weeks, never coming down to normal. After his admission, he complained of rather indefinite pain and tenderness in region of right iliac fossa, appendicular region. Nothing could be felt per Rectum. He proved to be negative to Enteric, Dysentery, Malaria and Relapsing Fever. No albumen, Leucocytosis. Laparotomy performed and appendix was found to be congested, tortuous and of abnormal length. After removal, the temperature subsided and his recovery was uninterrupted. In regard to this case my chief wrote me a note - "If this case be appendix with a temperature such as he has, I think the symptoms would be more acute". (Vide Charts III. and IV.)

As previously mentioned Blood diseases and local inflammatory causes of pyrexia have been omitted, the former because only the commoner conditions met with on Service are being considered, the latter because of their not infrequent Surgical aspect.

CHART/



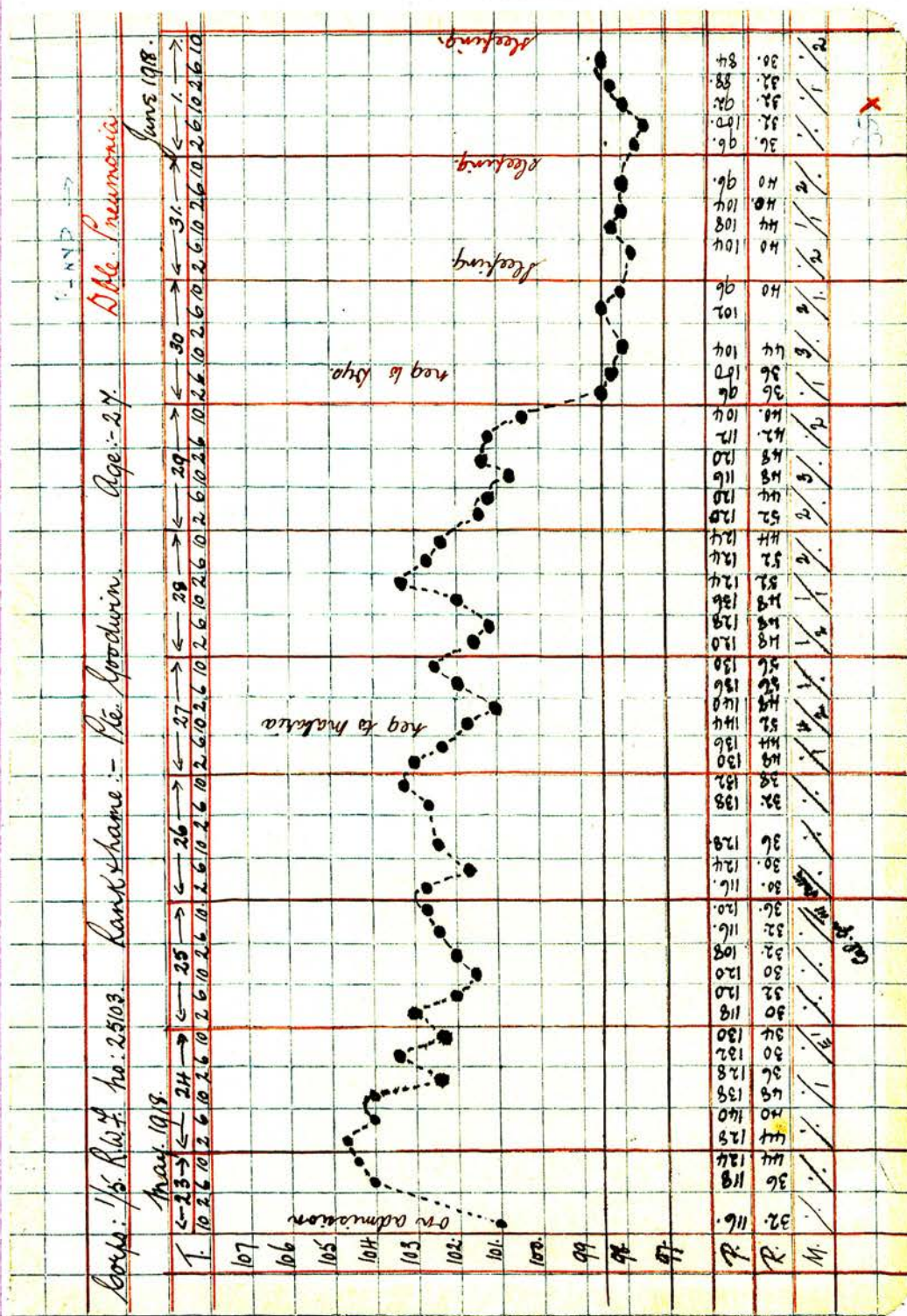
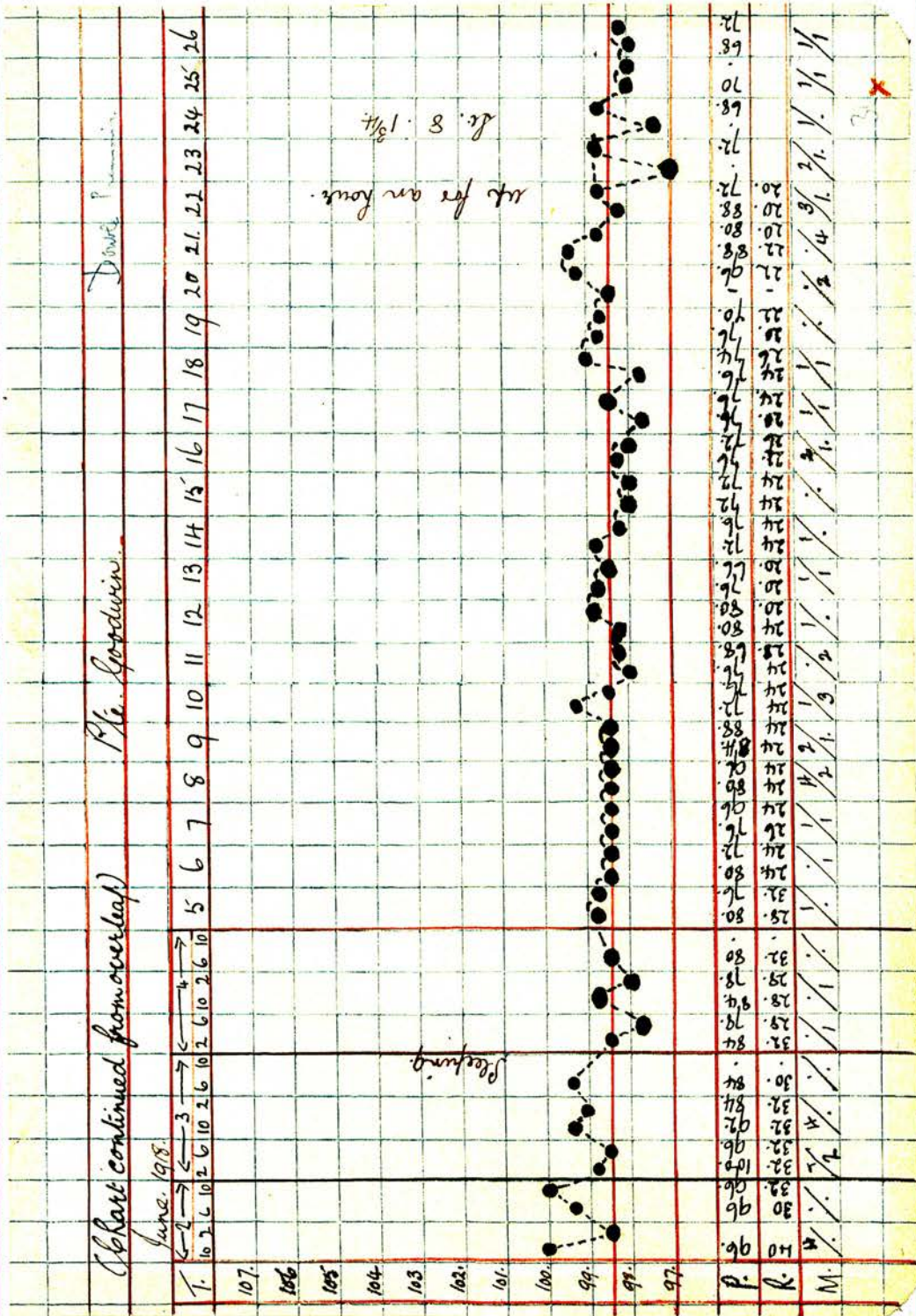


CHART 36.



II. PYREXIA in EUROPEAN CASES, especially - FRANCE, FLANDERS and BELGIUM.

For completeness, this would involve the discussion of an enormity of diseases. For brevity only a few will be mentioned in detail, and diseases, in which diagnosis is soon apparent to the skilled observer, will be omitted altogether.

a. TRENCH FEVER.

This disease which was extraordinarily common in France, was a subject of much research during the war, of considerable interest to everyone, to an extent chronic, resisting treatment, and accompanied by pyrexia of varying clinical types. It was seldom fatal and was introduced from France to Salonika, Egypt, and was carried by drafts to the Balkan and Italian fronts, and by the Germans to the Russian front.

It has been stated that nearly one fourth of the total sick wastage in France was due to this one disease, and it will, therefore, be considered in some detail.

Lice have been shown to have spread the infection. The incubation period varies from six to twenty-two days.

The/

The virus which is present in the urine of trench fever patients, sometimes in the sputum, is a filter passer. M'NEE concluded from his investigations that the infective agent was an intra-corporal parasite which could not be shown under the microscope. The Americans showed that the clear citrated plasma was infective and accordingly thought it was not intra corporal. Latency is a feature in Trench Fever, and in this respect it resembles malaria and increases the similarity to protozoal infection.

In chronic Trench Fever, there is an excess of large mononuclear cells which is also to be noted in Chronic Malaria.

Recrudescence has occurred four years after the original infection.

Some investigators found spirochaetes in the urine, in cases of Trench Fever, during and immediately after exacerbations of temperature, these spirochaetes were absent or scarce in apyrexial periods. Similar spirochaetes were found in the urethra of healthy men.

In 1914-15, the diagnosis attached to the patient was often "P.U.O.", "Myalgia", "Influenza", "Neuritis", "Rheumatic Fever", or even "N.Y.D.abdominal". From this one can imagine the possible varieties of character of temperature Chart and different symptoms./

symptoms.

VARIETY I.

Trench Fever produced a relapsing class, the relapses were regular with definite normal intervals or irregular, the intervals between the relapses being less definite, or if definite, the temperature did not reach the normal.

The disease probably had its origin in the front areas, but spread to the lines of communication after schools of instruction were established (1915.) Case of apparent undoubted authenticity have occurred in Hospitals in England.

In regard to the temperature, the rise was generally rapid 102°-103° F. being an average acme and chiefly occurring at the onset of the disease. On the third day the temperature falls, returning slowly to normal. The number of relapses varies from three to seven or more, as the relapses progress the highest temperature recorded is usually lower than the original acme.

Irregular fever may continue for several weeks after the apparent true relapses cease.

In passing, it is worthy of note that cardiac dilatation often occurred, Tachycardia being the rule, the pulse varying with the temperature, whilst relapses continue to appear. There is no doubt that many cases of D.A.H., were due to Trench/

Trench Fever. In regard to "Effort Syndrome" as it is not infrequently due to septic or infective conditions, the focus or foci ought always to be searched for, after the finding of one, others ought to be sought for. In cases of Trench Fever, with subsequent D.A.H., the mouth, throat and gastro-intestinal tract ought to be considered as possible foci of infection, without being satisfied that the cardiac condition is secondary to the Trench Fever alone.

Splenic enlargement was frequently noted. Shin pains were characteristic (garter-pain fever) and in some cases, zones of hyperaesthesia corresponding to the distribution of the lower dorsal or lumbar roots, more especially the distribution of the 1st and 7th dorsals. The tenderness of the 2nd and 3rd lumbar segments seems particularly common in the chronic infection. The pains were characteristically increased at night.

Punctate basophilia of the erythrocytes, a relative slight increase in large and small lymphocytes, diminution in hyaline cells and a reduction in the percentage of haemoglobin was the blood picture.

Transient albuminuria occurred.

VARIETY II.

In the second clinical variety, influenza was much simulated and the patient suffered from one short/

short initial bout of fever, which lasted about a week.

Shin pain as a rule was severe, the temperature seldom rose above 100° F., Tachycardia was frequently severe.

The difference between this variety and the aforementioned relapsing variety is probably a question of degree, the virus infecting the patient, some produced antibody more quickly and successfully than others.

VARIETY III.

In the third variety the initial fever is prolonged and enteric fever is greatly simulated. Vomiting and diarrhoea may be present. The initial fever may last from 6 days to many weeks. A number of varieties of charts are presented, the curve may be approximately uniform, or the ~~acme~~ may be at the beginning, the descent being regular, intermission for short periods (12 - 16 hours) or irregular relapses occur.

Tachycardia especially in the third week was often severe. Cardiac dilatation was not infrequent.

VARIETY I was common and predominant in the spring of 1915, and in 1918, about three quarters of/

of the cases of Trench Fever were of this type.

VARIETY II. or the short form was more common in the early months of the war and in 1918 formed only about 5% of the cases of Trench Fever.

VARIETY III. with its prolonged pyrexia was more prominently noticed in 1917 and subsequently.

DIFFERENTIAL DIAGNOSIS.

In France, the third variety had to be carefully differentiated from Enteric Fever, the second variety from Influenza.

In Egypt and Palestine, again the question of tropical diseases arose and sand fly fever, malaria, relapsing fever and Mediterranean fever, required consideration, in addition to the enteric group and influenza.

In view of the greater prevalence of Trench Fever in France and the importance of differential diagnosis from the Typhoid group, this will first be mentioned.

Trench Fever is now notifiable as from 1st March 1919.

I. ENTERIC FEVER, including TYPHOID, PARATYPHOID
A. and B.

Records have been produced to show that about 8% of cases of Trench Fever were proved to be Enteric, and this, on serological evidence. Clinically one might say that the two diseases could not be differentiated.

In considering Enteric Fever, as it occurred in the troops, one must remember the influence of triple inoculation against typhoid, which was so widely practised during the war, in fact, one might say, routine.

In former days the clinical symptoms were fairly well marked, and Widal's reaction of much value. The recovery of the organism was usual. If the patient had been satisfactorily inoculated, the cardinal signs and symptoms may amount to a continued fever of several days' duration, a slow pulse, an enlarged spleen, a few spots, headache, toxic look, furred tongue and perhaps some abdominal signs or symptoms.

Once again, the bacteriologist came to our aid and his "agglutination curve" justified its existence. In enteric fever, he discovered, that there/

there is an increase of the agglutinins with a consequent rise in titre - which reaches its maximum about the third week of the disease. The agglutination test was considered diagnostic and not infrequently the organisms were isolated from neither blood, faeces nor urine, even though frequent examinations were made weekly.

Many cases of Trench Fever presented features which in no way differed from the clinical course of enteric fever, and cases diagnosed enteric from bacteriological investigations, frequently presented no distinctive clinical symptoms which would differentiate them from Trench Fever.

The obvious importance of the agglutination test is manifest.

II. INFLUENZA .

In Trench fever, catarrh is usually absent, the prostration may be less, but the second variety of Trench Fever closely simulated influenza in many respects. During the Influenza epidemic of 1918, only about 5% of cases of Trench Fever belonged to the second variety.

III. PHLEBOTOMUS FEVER.

Relapses are uncommon.

IV/

- IV. MEDITERRANEAN FEVER q.v.
- V. MALARIA.
- VI. RELAPSING FEVER.
- VII. DENGUE. Presence of rash, vide ante.

b. I N F L U E N Z A .

The pandemic influenza which commenced at the termination of hostilities with its attendant mortality, cannot be discussed here. Volumes could, and have been written on the subject.

The study of epidemics resulting from wars is of interest, the war of 1870-71 ended to the accompaniment of pandemic smallpox.

The Medical Departments of the Local Government Board (1918-1919) published an interesting account of the devastating disease in 1918 and its progress down to April 1919, both abroad and at home, The study of the periodicity of waves is of much importance.

During the pandemic, doubtless, many cases diagnosed Influenza on account of its prevalence, were in the realm of P.U.O., but under the pressure of circumstances little opportunity for research was presented.

It/.

It has not yet been proved that *Bacillus Influenza* is the causal organism of epidemic influenza, but there is strong reason to suspect that it has played an important part in the pathology of the disease.

In point of time, merely, the pandemic of influenza was accompanied by the appearance of Encephalitis Lethargica in various parts of the world. Practically no pathological or epidemiological connection has been traced. This disease is probably not an example of a new disease, but one which has lately been brought into prominence in consequence of a change in its biological character. For centuries probably, outbreaks of lethargic illness with palsies have occurred, possibly instances of this disease, so called "new".

Recently the Ministry of Health issued a Memorandum on Encephalitis Lethargica indicating therein, precautions, advisable for individuals to take against infection. Isolation of the patient is recommended, although recent literature casts doubt on infectivity. The disease may either be non infectious or the infective material is widespread and among the majority of people there exists a natural immunity .

c./

c. CEREBRO SPINAL FEVER.

This disease is invariably accompanied by some degree of pyrexia at the outset.

In Egypt and Palestine, one had to exclude such diseases as typhus fever, typhoid, malaria and relapsing fever. Heat stroke and plague should also be mentioned.

In its onset, it may resemble influenza, commencing smallpox, scarlet fever, rheumatic fever, other forms of meningitis, chronic nephritis, with uraemia, acute mania, acute irritant poisoning, hysteria, etc..

Lumbar puncture is the final test.

d. TETANUS.

During the Battles of the Marne and the Aisne, Tetanus was very prevalent and it is stated that among the wounded who were brought to Britain, its incidence was 1.6 per cent.

The classical symptoms are well known, but where anti-tetanus serum has been utilized, these may be masked. Instructions were issued later (1916) for the use of this serum for all wounded men, and in cases of Trench feet, even without obvious break of the surface. Many cases of tetanus occurred in this disease.

A series of papers was written by the Tetanus Committee and some were circulated by the War Office for the use of Medical Officers, with instructions.

e. PULMONARY TUBERCULOSIS.

In dealing with the condition in its incipient stages, when the systemic disturbances may be much greater than the physical signs in the chest, the diagnosis was by no means easy.

Owing to an intoxication of the thermogenetic centres in the medulla, pyrexia is produced, due to the toxin product of the tubercle bacillus, and the product of tissue destruction. Doubtless the centre is irritable and supersensitive even with a mild toxæmia and it reacts excessively to moderate exercise or emotion and to other excitant factors which in the normal individual would produce no effect.

The fever is often irregular and the rise may be in the morning. The pyrexia may be mild and intermittent, as seen in early cases, continuous or remittent, or severe & intermittent, as seen in advancing cases. Rectal temperatures ought to be taken.

Some of the earlier symptoms such as lassitude, vaso-motor intoxication and toxæmic irritable dyspepsia/

dyspepsia, are present in a number of other maladies and, more particularly as part of a general neurosis. Hysteria, debility and neurasthenia may give similar early symptoms, but not the physical signs which are to be found in cases of early pulmonary tuberculosis.

The question of differential diagnosis is a wide one, and in the Mediterranean Areas more so, however, in cases of pyrexia a routine examination of the chest deserves mention. In all cases with a history of one or more attacks of Pleurisy, the sputum ought to be examined for Tubercle bacilli. Doubtless, many a latent tuberculous focus in the lung became active during service abroad, and in the East, the debilitating influence of heat is associated with the desert dust, in France the history of gassing by an irritant gas affecting the lungs, ought to be suggested, where lung trouble is under consideration.

A Special Sub-Committee on Tuberculosis (1918) epitomised some interesting and important factors in regard to the incidence and predisposing causes of Tuberculosis as occurring in the Services during the Great War.

In practice a many-sided look at P.U.O. ought to be taken and such conditions as oral sepsis post-nasal catarrh, chronic tonsillar affections, sinusitis/

sinusitis, recurrent prostatic abscesses etc., must not be lost sight of. Perhaps a few words on -

f. CHRONIC TONSILLAR AFFECTIONS

will not be out of place.

A very large percentage of the adult population present definite evidence of tonsillar disease, associated with the presence of pathogenic organisms producing under conditions favourable to infection, considerable systemic disturbances with well-marked pyrexia. Some have asserted that infection of the tonsils is a concomitant of the normal processes of atrophy. When infection is once established, it is a great difficulty to get rid of it, without resorting to complete enucleation, and following up treatment.

In the majority of cases rheumatic diseases are associated with the infection, and in a considerable number gastro-intestinal diseases.

The tonsils have great power of recuperation and in spite of the numerous invasions by streptococci and other organisms, they are not destroyed.

Some writers consider that debility (in the absence of organic disease) may be associated with pyrexia. The septic focus or foci may be in the mouth, throat or commonly in the gastro-intestinal tract.

NORMAL/

NORMAL TEMPERATURE of the BODY

In the mouth this varies from 98°-99° F. or 36.6°-37.2°C., and an even wider range is allowed by some authorities.

In regard to the question of temperature, it is important that the thermometer is accurate, of good quality and has been tested at the National Physical Laboratory. The times at which the temperature is taken ought always to be recorded on a Chart. A practical point is, that the thermometer ought to be left in the mouth for a period generally exceeding the time stated, as a rule, on the thermometer glass.

FINAL CONCLUSIONS and SUMMARY.

From a very short and incomplete study of Pyrexia uncertain in origin, the many difficulties in diagnosis are obvious. In a tropical climate, the realm of tropical diseases must be surveyed. The temperature Charts seen in books and described as characteristic of the diseases are not always found in practice. Diseases may run concurrently such as typhus, and relapsing fever. This possibility of dual or more infections is always present, and the mere finding of one causal agent, should never exclude the necessity for being on the outlook for others.

Many of the conditions present themselves in varying degrees of severity, and clinical varieties of types have to be considered in their many aspects.

In all cases a routine examination is necessary. A complete history ought to be elicited, all systems ought to be examined. The throat must not be overlooked. A urine examination is imperative.

Especially in the East, bacteriological examinations of the blood, sputum, faeces and urine are of paramount importance. The frequent repetition of examinations is also necessary.

One should never be shy of calling in the various/

various specialists when available, such as the Radiographer, and the Neurologist. A surgical opinion ought never to be forgotten:

With the advance of time and science our Pyrexias of uncertain or unknown origin will disappear from our statistics and the true causes will come to light. What is to-day spoken of as a disease may become a **syndrome** of to-morrow.

The greater future of research in this branch, probably lies with bacteriological research.

Throughout this paper, the Bacteriologist has played an important part, but a provisional diagnosis ought always to be made before the laboratory report is available. The Bacteriologist ought not to be depended upon as being the diagnostician, but ought to be considered a most valuable adjunct in the confirmation of a provisional diagnosis. The linking up of bacteriological investigation and clinical features of a case, ought to constitute a great advance in the wide field of future research in disease, and especially when it is accompanied by fever.

As our knowledge becomes more precise so will our treatment be less empirical and more successful.

During the War for the busy Medical Officer especially/

especially in forward areas, the term P.U.O., was convenient, but in practice it ought to be banished, and the more seldom the use of the letters the more obvious it is that the investigations of the cases have been thorough and searching, although perhaps owing to the evanescent state of a pyrexia, the diagnosis may only be tentative.

In regard to P.U.O., my thoughts always carry me back to Dr. Gee's allegory, "Medicine has three parts, the first is diagnosis, the second is diagnosis: and the third is diagnosis.

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